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MEDICAL EDUCATION

THE VARYING PHASES IN MEDICAL EDUCATION*

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THROUGHOUT the history of man's upward climb the overwhelming force behind the study and practice of medicine has been the compulsion of everyday needs. Medicine began as a craft ministering to the necessities of the moment, and like all crafts was passed from master to pupil in a direct and tangible fashion. As human culture evolved, the substance of each advance was incorporated into medical education. Thus, as formal teaching developed, there has been added to the craft such elements as the philosophic or humanistic, then that of basic medical science, followed by fundamental general science. Finally, with the comparatively recent flowering of the experimental method medical education is developing a strong emphasis on research.

All these elements have their place, but as each becomes established it tends to become overemphasized, sometimes to an extreme degree. However, when disproportion develops the practical problems of medicine inevitably exert their power to redress the balance and exercise a rejuvenating force. History shows that only by keeping its roots in the practical—even technical—problems of health and disease can medical education keep its own health and ensure its progress. A brief historical review shows the soundness of this view.

The apprenticeship of primitive medical crafts handed on little beyond direct skills. The meagre theoretical background would be limited to the dæmonic concepts of the tribe. Even when civilization made its first steps, the emphasis on the purely practical in medicine remained, and the earliest medical records in the Egyptian papyri of some 4000 years ago have no more than simple technical directions.

When Hellenistic culture developed the beginnings of formal instruction, the first type of organized professional training was that of medicine, with medical schools appearing towards the end of the sixth century B.C. (Marrou[4]). Soon after this Hippocrates appeared upon the scene and his teachings gave medical education a practical character directly related to clinical problems. However, the philosophical bent of classical Greece began to exert an ever-increasing force and much of medical teaching became a clash of wordy arguments among such sects as the dogmatics, empirics, methodics, pneumatics, and others.

But in spite of this, says Marrou in his "History of Education in Antiquity", "the teaching of medicine was mainly clinical . . . theory was reduced to a minimum and the main thing was practice . . . the physician was a specialist, a technician, and though in Hippocrates and Galen we find the true and interesting and thoroughly modern idea that a subject like medicine, if it is properly studied to its depths, can become a perfect and entirely self-sufficient manifestation of the highest culture . . . nevertheless this was not generally accepted in Hellenistic times. The pure technician was not normally regarded as a man of culture. Galen himself, who was keen to appear as an all-round man, lets us know that he had studied other subjects besides . . . medicine (and had studied) philosophy before he started on medicine."

Marrou continues in a vein that is echoed by many educators today and therefore deserves quotation. Thus "Classical teaching was chiefly interested in man himself, not in equipping technicians for specialized jobs . . . [it] flattered itself that it could provide a standard training for every type of student. It aimed at developing all his potentialities without mutilating a single one, so enabling him to fulfil to the best of his ability whatever task should later be imposed upon him by life, or by the demands of society, or his own free choice." He quotes Julian the Apostate as saying "Any gifted person who has received a classical education is capable of great things in any direction; he can take the lead in science or

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politics just as easily as he can become a man of war, an explorer or a hero."

Finally, Marrou sums up the humanistic philosophy by saying that ". . . Hellenistic education . . . made provision for the kind of professional training that an apprentice receives from a master who takes him on as an assistant. But the classical mind regarded such a narrow focusing of the mental powers as a handicap: it was considered self-evident that the main thing was to become a person of intelligence, someone with insight and good judgment. As for a profession, that was something to be learned as quickly as possible; anyone with any intelligence could soon learn to turn his hand to anything practical."

Such a philosophy has a grain of truth but when carried to excess it has given rise to all sorts of medical cults, such as Christian Science, vegetarianism and similar aberrations that appear often among educated people who have been "over-humanized" and "under-scienced".

The wholesale application of this idea to medical education was disastrous. As Allbutt says of Galen—"Unhappily his soaring genius took delight also in the spheres of speculation . . . Galen did not himself forget the precept of Hippocrates—to look, to touch, to hear . . . but he did not wholly subdue himself to this toilsome conversation with troublesome facts . . . Nay, possessed by Platonist visions, enamoured of an elaborate teleology of his own . . . he formulated an eclectic doctrine contrary to the experimental reason and taught categorically that speculation shall guide experience. So it was that he imposed philosophical lectures upon medical students as preliminary to medical study . . . and foistered metaphysics in another guise on medicine." Allbutt adds, "The aid of the humanist in the development of medicine was no unmixed advantage; for if in arts and letters they were reformers they were for the most part as scornful of handiwork, and as alien from natural knowledge, as the clerks and nobles."

The logical outcome of this emphasis on the philosophical at the expense of the practical was mediæval scholasticism, and by the ninth century A.D. it was in full sway. Riesman,[6] in his "Story of Medicine in the Middle Ages", describes it thus:

"Words became more important than the subject matter; the idea that the problems of nature, including medicine, could be solved merely by speculation resulted in characteristically vapid discussions or 'dialectic' on problems often unimportant or, if important, formulated so as to be trivial, unsubstantial and naïve . . . The influence . . . on medicine was devastating: medical men neglected the Hippocratic method of sober bedside study, and put their energies into discussing what authors long dead had said about disease rather than studying disease itself . . . The scholastic reduced all science including medicine to the art of reasoning, and any regularly formed syllogism carried conviction with it regardless of the premises on which it rested . . . The system was, as Duperoy says, a sort of intellectual gymnastics . . ." Riesman goes on to list some of the topics debated such as: Does a libertine life lead to baldness? Does the fetus resemble the mother more than the father? Is air more necessary than food or drink? Is woman an imperfect work of nature?

To those who work in the field of university education some of the excesses committed under the urge to "teach students to think" are reminiscent of such scholasticism in their remoteness from practical experience.

Petrarch in the fourteenth century said with fitting scorn, "Medicine is not benefited by the art of disputation. The physician loses sight of the real needs of the sick and in order to bring health he fills him with syllogisms. Formerly one treated the sick without philosophizing too much. Now artificial conclusions are drawn and the patient remains sick. Many thousands die while the physicians argue and perorate."

When in the early sixteenth century Vesalius brushed aside the philosophic cloud to take the dissecting knife himself he rejuvenated medicine by the appeal to the practical. But medicine was hardly far enough advanced to use much of what he discovered and the impact might have faded temporarily but for a curious practical value accruing to the new science. While the physicians expended most of their energy on polemics the artist was discovering a very practical value in the study of anatomy. Many like Leonardo da Vinci found in it a means of advancing their craft and by their studies gave a marked impetus to the pursuit of anatomy. Once again the touchstone to progress was the influence of practical needs.

In this connection it may be noted that the reason why so many medical discoveries languished and were even temporarily forgotten was that they were too early for practical application and so became latent and frequently lost, to await rediscovery when the time was right for their practical use.

Formal medical education gave grudging place to proper anatomical studies. In fact, the lukewarm attitude of the universities of western Europe led to the historic split between medicine and surgery which was really a divorce of the philosophical from the practical. Riesman says that in the University of Paris medicine referred strictly to medicine and did not include surgery: "Surgery was excluded from the curriculum not only in Paris but also in Oxford and Cambridge . . . The Professor . . . when demonstrating anatomy only made use of the services of a surgeon-barber, for anatomy was only a manual exercise and commanded no respect." And Davidson[3] in "Medicine in Oxford" quotes Anthony Woods as saying in connection with the early beginnings of the Royal Society that this group was ". . . undervalued by Aristotelians, Galenists, profound dis-

putants and Schoolmen, who looked upon such operations as much below their philosophy, and rather to be embraced by Quacks, Salvers, and Apothecaries' boys than by them."

In contrast to this attitude, in Edinburgh, as early as 1505 the Surgeon-Barbers' Corporation requested the body of one condemned man per year for anatomical study because, the petition said, "every man ought to know the nature and substance of everything that he works, or else he is negligent" (Miles[5]). This is a heartening statement of a timeless principle in medical education and one that needs re-statement from time to time.

The universities of western Europe gave little heed to this truth and it is a commentary on the lack of the practical element in formal medical education that the most significant advances in medicine were made by William Harvey and John Hunter, both immersed in the immediate problems of medical practice and one of them entirely unschooled. Again the major advances in anatomy during the seventeenth and eighteenth centuries came from the surgeons who saw the science in the light of the needs of their craft.

In the seventeenth and eighteenth centuries, the so-called age of enlightenment, the universities gave such scant lead in medical education that the private and hospital schools came into being. In the latter an atmosphere was created in which science and practical medicine could meet and interlock and once again the correcting and rejuvenating force of practical medicine became apparent. The proof of this is the marked development of preclinical and clinical sciences that occurred in the hospital schools, and the result was the laying down of the lines along which modern medical education has developed.

The nineteenth century found the universities reluctantly and grudgingly forced to accept the teaching of science as part of their responsibilities. The battle waged by Thomas H. Huxley is too recent to need detailing here, but there is still an undercurrent of the old idea that science, and particularly science in professional training, is not quite as respectable as humanistic studies. Fortunately, authoritative voices are raised occasionally to protest the idea that formal courses in the humanities are necessarily the *sine qua non* of culture. Sir Henry Dale[2] has said with eloquent common sense: "We shall have to beware . . . of allowing traditions and ideals derived from a period when the accepted object of higher education was to provide a cultured occupation for the leisure of a privileged few to retain their influence on policy into a period when access to higher education is being offered to all who can benefit by it . . . I pin my faith to the power of a university to give to the student of any subject in its curriculum, if rightly presented, a feeling for precision in knowledge and thoroughness in its mastery, for the adventure of exploration beyond the boundaries of the known, for victory over intellectual difficulties, and for passionate pursuit of truth . . . I believe that either the data of science, or those of literary or historical scholarship, can be made intellectually deadening if they are indifferently presented; but that either can be made the means of awakening the mind to the joy of knowledge and of intellectual triumph, and of creating therewith a fertile soil on which sound judgment can grow with the ripening years."

The practical values of the advances in science generally brought medical education back to the university with immense profit to both, and while medicine has undoubtedly gained thereby, the university has benefited more greatly than many are prepared to realize from the practicality and immediacy of medical problems. Yet there is a peculiar persistence in some quarters of the mediæval point of view. There is a sort of asceticism that tends to decry practical values even in scientific education. It is said that the university is not concerned with the teaching of techniques or craftsmanship but is dedicated to something deeper and more fundamental. The truth is that while professional education may swing to either extreme there is really no sharp line of division. Medical education cannot fulfil its purpose without a judicious blending of both elements. Clifford Allbutt[1] put this well when he said:

"In the minds of academic teachers the notion still survives that the theoretical form and the practical or technical form of a profession or other calling may not only be regarded separately and taught in some distinction—which may be true—but in independence of each other; nay, that the intrusion of a technical quality by materializing tends to degrade the purity or liberality of the theoretical . . . Thus the university is prone to make of education thought without hands: the technical school, hands without thought . . . But if in a liberal training the sciences must be taught whereby the crafts are interpreted, economised, and developed, no less do the crafts, by finding ever new problems and tests for the sciences, inseminate and inform the sciences . . . We need sorely the elevation, the breadth, the disinterestedness, the imagination which the universities create and maintain; but in the universities we need also the bridges in every parish between the provinces of craft and thought . . . If we forget the hands, the cunning loom which wove our minds, if thrusting them into our pockets we turn our eyes inwards, will our minds still grow true? . . . The bane of our profession for the last millenium has been too much thinking; we have actually made it a point of honour to ignore the hands out of which we have grown and in this false honour to forget that the end of life is action, and that only by action is action bred."

There is scarcely space to show how the very important idea of research and experiment has now won a merited place in medical education.

It, too, is likely to repeat history and overswing the pendulum for a time.

The problem is not quite as new as may be thought. In 1911 at the opening of the Pathological Institute of the Royal Infirmary of Glasgow, Sir William Osler spoke of the "hurly-burly of today, when competition is so keen, and there are so many seeking the bubble reputation at the eye piece and the test-tube . . ." and he warned of the danger of the teacher ". . . who wraps himself in the cloak of his researches."

More recent notes of caution have been sounded, as, for example, this by a contemporary professor of medicine: ". . . the dangers of overemphasis on research in medical education should not be underestimated, even if untold advantages accrue to the teacher in medicine who is interested in and occupied with research . . . Although the progress of medicine will mainly depend on research and experimentation, the fact remains that 75% of the knowledge of the clinicians can only be acquired by humble empirical observations at the bedside under the guidance of experienced clinicians. This part of medical education may suffer in certain schools where departments of medicine are directed by full-time scientists who . . . have only scant interest in empirical knowledge without which the clinician cannot do his work" (Snapper[7]).

There is indeed a danger that an unrestrained philosophy of medical research may so dominate medical education as to lead to a new remoteness and self-satisfied asceticism comparable in nature and consequences to that of the earlier overemphasis on philosophy and logic. It could also lead to a similar temporary divergence of university and medical education as happened before. Even now the junior hospital internship is looked upon by some as in the nature of a repair shop for the deficiencies of undergraduate medical education. However, the practical nature of medicine will restore the balance as it has always done before.

There will be those who will decry this emphasis on the practical in medical education. But if they ponder the lessons of medical history they will be less disturbed and more likely to strike a proper balance. Whatever may be considered as objectives in other types of education, medical teaching dare not stray far from its practical character, for in that lies its true strength. Sir William Osler, who was certainly in full sympathy with the humanistic and intellectual values in medical education and who never wearied of making eloquent pleas for the proper training of head, heart and hand, nevertheless chose to put on the title page of a notebook for his medical class the following quotation from Froude:

"The knowledge which a man can use is the only real knowledge which has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain or dries like raindrops off the stones."

REFERENCES

1. ALLBUTT, T. C.: Historical relations of medicine and surgery, Macmillan & Co. Ltd., London, 1905.
2. DALE, H. H.: An autumn gleaning, Pergamon Press Ltd., London, 1954.
3. DAVIDSON, M.: Medicine in Oxford—A historical romance, Blackwell Scientific Publications, Oxford, 1954.
4. MARROU, H. I.: History of education in antiquity, Sheed & Ward Ltd., Publishers, London, 1956.
5. MILES, A.: Edinburgh school of surgery before Lister, A. & C. Black Ltd., London, 1918.
6. RIESMAN, D.: Story of medicine in the middle ages, Paul B. Hoeber, Inc., New York, 1935.
7. SNAPPER, I.: *J. A. M. A.*, 170: 442, 1959.

PATIENTS MAKE GOOD TEACHERS*

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THE FUTURE place of psychiatry in the undergraduate curriculum will depend largely on how successfully it can be taught. In the past, psychiatric teaching has achieved little success. It has neither attracted the medical student, nor produced a graduate willing and able to cope with the psychiatric problems of his patients. So we must seek to improve our teaching method.

I believe that teaching could be better if it were more firmly based on the care of sick people; so my theme here is that patients make good teachers. I shall try to demonstrate this by describing how we make use of patients in psychiatric teaching at the University of Saskatchewan. We give students major responsibility, first for diagnosis, and later for treating those with psychiatric disorders, during their third and fourth medical years. Here I shall describe our objectives, methods, and the reactions of the students, teachers and patients to this mode of teaching.

Both in-patients and out-patients participate. The aim is to give the student maximum responsibility compatible with both good teaching and the best interests of the sick. For the students, we have to find a balance between independence on the one hand and supervision on the other.

OUT-PATIENTS

Out-patients are made use of in both the third and fourth years to teach interviewing, diagnosis and assessing treatment needs. Each student examines, and presents to his instructor, a total of 16

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out-patients—eight in each year. The patients are selected from those referred to the psychiatry department for consultation, either from non-psychiatric departments in the hospital or from family doctors in general practice.

We insist that the student act as the main examiner, with careful, but unobtrusive, supervision from the instructor. We try to achieve this by having the student spend two hours with the newly referred patient before the psychiatrist is called in. The student receives this patient at 1:30 p.m., completes his examination, talks to any relatives, and formulates the problem, the diagnosis and the treatment plan. He does this by himself.

Then at 3:30, two students, each of whom has examined one patient, meet with their consultant. The first student presents his patient, who is interviewed by the consultant and made the subject of a conference by this teacher with the two students. This usually requires one hour for each of the two patients. For the student the session lasts from 1:30 p.m. to nearly 6:00 p.m. The students then have 24 hours in which to provide the consultant with the completed history and the conference summary; then the psychiatrist completes his report to the referring doctor.

Now several questions arise. Is this good teaching? How do the students respond? How do we get enough instructors to have one for every two students? Do we have enough patients? How do the patients react to being subjects for teaching? We think this is good teaching. The students much prefer it to the old style of clinics of previous years. Their anxiety, elevated by the interview, stimulates interest and attention; they ask good questions. Almost for the first time, they see themselves in the role of the doctor—the student is the first to hear the sick person's story.

Having such dynamic examples at hand, the consultant finds this teaching stimulating although exacting. He must deal with the needs of the patient, the student, and the referring doctor—all in one package. However, he can see the clinical skill of the student grow during this span of eight weekly sessions. Fortunately, our 40-student classes are small enough to permit this type of teaching even though we have a pool of only five or six consultants; each works an average of three hours weekly in this program.

Now, such a pattern requires about 400 suitable new referrals each year. So far we have had no serious difficulty obtaining this number. True, the day is long for these patients who must attend from 1:30 to at least 4:30 and sometimes 5:30; however, they are warned of this when the original appointment is made. Since most of the time is spent being interviewed by an interested person, the patients usually do not find the stay too long. We have had no serious complaint about the program from any of the 400 patients seen this past academic year. They realize that this is not only help for them, but also a teaching exercise; they understand why they are seen both by the "young doctor" and the supervising "old doctor", but they do not seem to resent this; some even get a lift from it.

IN-PATIENTS

The one month spent by the fourth-year students as full-time clinical clerks in psychiatry provides similar responsibility with in-patients. As each student begins his four-week term, he is assigned two newly admitted patients. He is their doctor throughout the month. He greets them, examines them, carries out psychotherapy and organizes the other treatment.

Again questions arise. How successful is this as a teaching medium? How can a student take on so much responsibility? How is the patient protected? How do patients react?

We find this method excellent for getting the student involved in psychiatry. Some students have said, "I came here with doubts about psychiatry, but this has been my most interesting service. Here, I am a doctor"; for no student can remain indifferent to the problems of a patient for whom he has responsibility.

As far as the patient is concerned, the student (and none other) is his physician. I have had the common experience of making a suggestion to a patient (who was nominally mine) only to have him turn to a fourth-year student to see whether or not he should accept what I had said.

We protect the patients both through selection and through supervision. This open 40-bed ward in a teaching general hospital admits a cross-section of psychiatric problems. To our amazement, students handle most types of psychiatric disorders successfully. One selection problem is the need to predict which patients will stay on the ward for about 28 days—the duration the students stay. If the patient remains longer, he finishes his treatment under the student's supervising resident.

The adequacy of supervision is the real key to success or failure in this program. Each student is responsible to a resident who unobtrusively but carefully checks the examination, the diagnosis and the treatment plan. The resident in turn keeps the staff psychiatrist informed at all times. Formerly, we had the students directly responsible to the staff psychiatrist, but inserting the resident in the line was a great improvement. The resident is on the spot—he is always available—an important item in supervision.

Patients react very well to the students. We have had fewer complaints about medical care given by students than by residents and senior staff. For here is an interested, involved, yet humble doctor prepared to spend no end of time with his patients. On this the patients thrive. For not only do patients make good teachers but also medical students can make good psychiatrists.

These students learn psychotherapy, they learn how to gain rapport and how to provide support.

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They learn the importance of ward milieu and of family relationships. They learn the use and the limitations of electrotherapy and tranquillizers. They are taught what we consider the general practitioner should know about psychiatry.

How the Students are Prepared

We use the two pre-clinical years to prepare the student for this responsibility. During these first two years of psychiatry our aim is to provide motivation and knowledge. From the first year on, we make it clear that psychiatry is a major problem in medical practice. The student must learn psychiatry not only to pass the examinations but also to be a good doctor. We teach that the family doctor will have to diagnose and treat most of the psychiatric disorders himself, referring but a small percentage to the specialist.

For basic psychiatric knowledge the student receives 35 lectures during his first two years; these cover the diagnosis and treatment of the psychiatric symptoms which he will see in general practice. In addition, he has 24 hours of lectures and demonstrations in interviewing and mental examination. In his third year there is a course in psychopathology, psychosomatic medicine and such special problems as marital maladjustment.

The main point of this teaching program is its emphasis on instructing by giving the student responsibility for patients. This requires careful supervision and support. It is necessary to have adequate curriculum time, adequate teaching staff and much hard work in organization. However, if the doctor of the future is to deal with the psychiatric ills in practice, psychiatry must have an important place in the medical school curriculum. It must be well taught—we have found it helpful to realize that patients can make good teachers.

PÆDIATRIC EDUCATION*

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WITHOUT ANY THOUGHT of being derogatory, I would suggest that the objectives of pædiatric education may be specifically divided into two groups: those objectives which are suitable to the countries of Western Europe and the North American continent, as being areas of economic self-sufficiency, and those suitable for countries of the Middle East, Far East, and Africa, which must for the present be regarded as areas of economic insufficiency, in which that portion of the gross national product which may be budgeted for educational purposes or for purposes of medical and pædiatric care is insufficient to provide the advanced standards of living, medical care, and hospitalization possible in the economically more fortunate countries of the New World. I propose, therefore, to divide my remarks into, firstly, suggestions for pædiatric education applicable to only the one area, and, secondly, proposals which could, by their nature, be applicable to the second group. In so doing, there is no sense of invidious comparison, but rather an effort to be completely objective in offering some appraisal of the type of pædiatric education suitable to each of the two areas.

Areas of Self-sufficient Economy

It is my brief that pædiatric education for the area of self-sufficient economy is at present being quite markedly over-emphasized. We are providing our undergraduate medical students with considerable instruction and learning in the field of the prevention of disease, and the adequate care of the acute episode of illness when it does arrive. We are also assuring ourselves that at the end of a two-year period of general internship after graduation from medical school, the product of our schools is adequately informed and trained in the techniques of the care of children, both in the fields of physical illness and in the emotional disturbances resulting from faulty child-parent relationships, so that more than 90% of the total medical care required by children in these countries can be, by and large, adequately provided by the modern general practitioner. Additionally we are providing training and education for a large number of young physicians who have expressed a desire to confine their practices to a given age group. We as teachers utilize this group of young physicians for the care of patients entrusted to our efforts in various university children's hospitals, with the concept that, since we have in the previous 25 years educated the public, as the consumer, to expect pædiatric care to be provided by one who has undergone a long and rigorous period of training, the expectation is warranted that this demand will continue indefinitely, rather than be adequately provided by well-trained general practitioners. Hence we continue, in my opinion, to train over a period of four or five years of postgraduate study, a larger number of pædiatric specialists than the public economy will support in a manner and at a financial return warranting the expenditure of time and of funds which have gone into their training. In addition we look forward to

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the continued provision of university teachers in the field of pædiatrics, and the provision and support of an increasing number of workers in the field of pædiatric research. It is my contention that in so continuing a program of training, which in the past quite justified its inception, we are omitting recognition of the fact that while advances in pædiatric care have in some measure been the result of the efforts of pædiatricians, much of the glory which we claim as a specialist group has in some measure been the result of efforts and achievements in allied fields, particularly in the fields of organized public health. Such a large number of specialist-trained doctors are not now needed. I refer particularly to the effect of the pasteurization of milk on the incidence of diarrhœal disease; the effect of the work of the immunologist and the bacteriologist on the decreased death rate and incidence of infectious disease; the effect of the antibiotics on the incidence of syphilis and tuberculosis; the effect of the public health doctor and of our advanced school systems on the dissemination of health knowledge, disease prevention, diet, and occupational health. Many, if not most, of the acute illnesses of children with which I began my pædiatric experience have in large measure disappeared, owing, in at least some degree, to the work of other agencies.

The burden of my argument is, therefore, that in regard to economically sufficient countries, we are probably demanding too long a period of the young doctor's life to be spent in acquiring skills which, in at least many instances, he will not in later life have an opportunity to utilize. By so doing, we are making it an economic necessity that this young man should have a high financial return to compensate for the expense to which he and his family have been subjected, in relation to both time and money, to a level which may, in some instances at least, preclude his services being available to the group of the community whose need for such service is greatest. In fact, the present trend to specialist care in these countries is likely, because of its cost, to be self-defeating, unless possibly we are to look forward to some form of state support for medical care as a whole, and pædiatric care in particular. While the foregoing argument is by no means novel or unique, it can also be argued that the widespread continuation of specialist pædiatric care in the community tends to increase the danger of propagation of the fragmentation of medicine and of its services, of which my generation in this area of the world is only too well aware.

I would plead, therefore, for a return of pædiatric care to the "family physician", and I would emphasize the connotation of the two words "family" and "physician". I would conceive the adjective "family" in regard to the physician to connote one who is competent in the care of the acute episode of medical illness in the family, irrespective of age group; one able to recognize and treat heart failure in the adult and in the child, to recognize coronary disease, to prescribe the necessary care for the maladies associated with middle life and advancing years, to provide some counselling advice in emotional problems of childhood, to recognize psychosomatic illness and the major psychoses, and to be sufficiently well-versed in all these fields to appreciate when he is beyond his depth, and to know where he could secure specialist advice to complement his own efforts. The word "physician" I would interpret to mean a graduate of a modern medical school where scientific medicine and the application of laboratory findings, but not necessarily their techniques, were made clear to undergraduate students, and one who had had sufficient hospital and out-patient training to make it possible for him to carry the fruit and methods of scientific medicine to the bedside of the patient in his own home; one who was able not only to recognize both incipient and established disease, but was competent in their care so far as is possible outside the hospital situation; and sufficiently versed in the natural history of disease as he had gained it from his reading or from his experience in tutelage with senior physicians to be able to appreciate the limitations imposed on his efforts by the nature of the disease, and the constitution of the patient; and in view of such limitations, to be able to treat him rationally, and later to outline a reasonable mode of life to permit the patient to continue to realize that level of existence and of effort commensurate with living with his disabilities.

From the foregoing remarks, you will appreciate that it is my belief that we in this favoured economic area are attempting to produce more and more pædiatric specialists, men possessing years of training and observation in pædiatric hospitals, and are turning them out into practice and family care, but imposing on them a limitation of their activities by an artificial age standard, when the whole nature of their training should be applicable to the care of all the members of the family. I am quite persuaded that the general practitioner who is now graduating from our medical schools and teaching hospitals is competent, if he is interested, to care for most conditions of childhood, and that such care should be provided within the framework of care for the whole family. It is suggested, therefore, that our efforts in pædiatric education should be towards the provision of adequate knowledge and techniques for men who are going to be family physicians.

The word "physician" should denote one who is competent in the field of internal medicine, without necessarily being an expert in cardiology and the introduction of cardiac catheters or in the interpretation of all manifestations shown by radiographs of the pulmonary fields or the use of radioactive iodine; one who is competent to recognize when to use such means of investigation, competent to care for the patient with an acute pulmonary

infection or acute abdominal crisis, whether in infant, child or adult, and able to interpret what he has found on history and examination, and to have some concept of when and what further means of investigation are needed for the adequate care of the patient. As Professor Robert Loeb has expressed it, one who is competent to carry present-day scientific medicine to the bedside in the home, and to interpret what further means of investigation in hospital, whether a cottage hospital or a teaching hospital, may be elucidated in the hands of those who are learned in the more intricate procedures. Such a concept of the "family physician" would do much, I believe, both to lower the cost of medical care, while still remaining adequate, and to diminish the degree of "fragmentation" which is presently occurring in both our teaching and our practice, and of which the public is all too impatiently aware. Such a credo does not imply that highly trained pædiatric teachers and consultants and research workers in our field will not continue to be needed to advance the fringes of knowledge—quite the opposite. We do need such men in order that the value of contemplation and the philosopher's approach to our problems may not be lost. Such activities are rarely to be found in those who delight in the turmoil of a busy practice of pædiatrics.

I would now like to indulge in some comment on the topic of medical education on this continent. Probably few of our Asian and African confreres appreciate that here we deem it necessary that potential pædiatric specialists should have a minimum of 25 years of education before we consider them competent to practise pædiatrics as a "specialty"! These 25 years are spent as 13 years of grade school and high school education, four years of college work, followed by four years of medical school, and four years of graduate training. Even with such a long period of tutelage and apprenticeship, we are not satisfied that the results are adequate. Partly as a result of the long period of training demanded, which excludes some otherwise interested students, we are at present admitting to our medical schools students who are not only inadequately motivated to the study of medicine but are, in the view of some, inadequately prepared. As a matter of fact, specifically in relation to the medical schools of Canada, an inadequate number of young people are applying for entrance to medical schools, so that, in some areas at least, there are so few students applying that selection procedures for admission are hardly necessary, and almost anyone who applies can be admitted if he meets basic requirements. In Canada it seems probable that in the immediate future some effort must be made by the medical profession to encourage superior students into the study of medicine. We are aware that there has been a decrease in the number of students entering medicine with a Grade A classification on their college record, and it is apparent that the students whom we seek have essentially the same intellectual qualities as those going into other branches of science, or even into commerce. If we are to secure adequate numbers of adequately prepared students in medicine, it would seem reasonable that we of the medical profession should take some steps to encourage youth to look to a life of community service in the field of medicine, and particularly as servants in the field of general practice. Since most of the child care which is required on this continent is, and should be, provided by the family physician, I would suggest that the course of training provided for such practitioners consist of the four years of college work, followed by four years of medical school, and a formal two-year internship; and that the internship consist of a minimum of six months of internal medicine, six months of pædiatrics, six months of psychiatry, and the final six months divided between obstetrics and any other special field in which the potential practitioner may have developed an interest and wish further experience before undertaking the responsibility of family care. Such a program would by no means qualify him as an expert in any particular field, but would give him an adequate sense of security in the care of patients of any age group who are suffering from any of the more common diseases. He would by no means be a finished psychiatrist, but would know a good deal about psychosomatic illness; not competent in the total field of diseases of children, but probably in 90% or more of problems in the field of pædiatric care, and of the management of the medical diseases of adult life. It is not my feeling that particular training in the field of surgical therapy is desirable for the general practitioner.

ECONOMICALLY INSUFFICIENT AREAS

As I recall from my very brief exposure to economically insufficient areas in the Middle East and in Continental Africa, the prime need in these areas is for the implementation of modern concepts of public health; the practitioner providing family care including pædiatric care in such areas must have a definite orientation to promulgation of public health concepts. In some measure the term "pædiatric education" for specialization is the connotation of a luxury which is presently beyond the financial means of such areas. Until the provision of adequate water supplies, adequate food and adequate protection of such foods so that they remain fit for human consumption, and with this the control of both infectious disease and communicable disease, and the control of epidemics by adequate patient care and protection of the community from infection, the idea of pædiatric care as a special division of medical education is fanciful. Until some degree of public health education in addition to ordinary school education becomes available and is implemented in such areas, any concept of pædiatric education and pædiatric

care, such as we in more fortunate countries enjoy, is not a reasonable proposition. The basic requirement as I see it is the provision of training and education, including the care of children, primarily for the so-called *basic doctor*, as defined in the proceedings of the First International Conference on Medical Education. To achieve such an objective requires the provision firstly of more, and more adequate, basic education, and the provision of medical education to the inhabitants of such areas, by the establishment of appropriate medical schools, *on the ground*. The provision of such schools naturally entails the provision of teachers, and the area in which we more fortunate citizens of the world can be of most assistance is, I believe, in the provision of suitably trained teachers, until such time as nationals of the region are able to take over this function; having in mind particularly the need for educating them to become physicians with adequate training and experience in the fields of public health that I have suggested. Particularly do I believe it to be essential that the future physician of the region be trained in his own locale. The objection to bringing students into the modern society of areas of economic sufficiency is the inherent danger that on return to their own country such students will be unable to re-orientate themselves to the problems indigenous to the region.

In the field of pædiatric education this means the provision of teachers from our own area, and I can think of no greater service to pædiatric education in such areas than the provision for periods of one or two years of men who have been trained as teachers or investigators, presumably at the resident level, who might make their teaching abilities available to future medical schools which might be established in such areas of economic deprivation. Particularly is this true if these future teachers have had some experience in the methods of organization and control associated with public health education. Since the numbers of patients to be seen will for years be greatly in excess of any bed accommodation that might possibly be made available, such pædiatric education should be orientated particularly to the care of the ambulatory patient, and even the acutely ill child who might require scientific medical care within his own inadequate home. My suggestion would be that pædiatric education for such areas should in large part be non-hospital centred; that, for the immediate future, pædiatric education for such areas should be group-orientated rather than individual-orientated, even though, admittedly, the group is composed of individuals. However, the point of my plea would be that the pædiatric education of the immediate future for such areas should have a distinctly public health flavour, and that until the gross public health problems which I have enumerated, including nutrition in childhood, are at least brought under some type of control, the training of the pædiatric physician and the direction of his education should be in the direction of control of disease in the mass rather than in the individual.

Parenthetically, as an illustration of the point I am anxious to make, I will quote a personal experience of some few years ago in Nairobi, where I attended a well-baby clinic for local children, conducted under the direction of an earnest European doctor. The question was raised as to the cause of the apparent anæmia in many of the relatively well-cared-for children seen in the clinic. When I asked what the frequency was of intestinal parasitism in children in the area, information was not available; similarly, as to the frequency of malaria manifested by splenomegaly, information was not available. When it was suggested that deprivation of dietary protein might be related to the apparent anæmia, the protein intake of such children was not known. Obviously these are not strictly pædiatric problems, but problems in public health, in the sense of the health of the public as a large group. It is known that in Central Africa probably only the Masai have solved some of the difficulties of a protein-poor diet by their practice of bleeding their domestic herds at regular intervals, and including the blood so gained in with their ordinarily high carbohydrate diet. These remarks are intended merely as examples of the type of "pædiatric" education which is needed for such areas.

Admittedly the future would require local teachers, possibly specially trained outside their own environment, who might return to carry on the teaching begun by temporary visitors from outside. This does not suggest that there are no teachers of competence already available in these areas. It is simply an appreciation of the fact that in proportion to the problems involved they are too few in number and too widely spread. Support for such an increased number of teachers and the question of their status in relation to the inhabitants whom they wish to teach are problems outside this presentation. Likewise, the question of state support for such practitioners and the possibilities of state political control are also beyond this province. However, I do believe that pædiatric education for economically inadequate areas should be slanted towards the provision of good family care as we understand it, including all members of the family. It should provide control by physicians orientated towards public health of the mass problems of disease in such areas, and the recognition and therapy of the individual case when the disease has by adequate means of investigation become apparent. In contrast to the curriculum of factual content in use in our schools, the teaching should contain a *greater* emphasis on both the techniques of breast feeding and of its limitations; methods of prevention of infection by water- and milk-borne organisms; the control of tuberculosis; the theory and practice of immunization by prophylaxis; the recognition and therapy of transmissible maternal disease; the rela-

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tion of intestinal parasitism to overt manifestation of disease, and protein deficits, and the prevention and therapy of such infestations; and other similar topics. However, such topics should, in my belief, be presented within the context of the student's life-experience and on the terrain where they will function, rather than from a book, in an entirely different cultural setting. While to many of us tropical medicine, seen on our brief visits, is interpreted as medicine in the tropics, the fact that it is in the tropics and in a different cultural setting does make it a different kind of medicine; one which should be taught from a different point of view by teachers who have a knowledge of the social setting in which it will be practised. Such an idea might even include seeking the collaboration rather than the enmity of the local medicine-man or witch-doctor in some areas, both geographical and therapeutic, where such men are of known prowess!

In summary, much of what is accepted general knowledge in our culture and that has been almost discontinued in our pædiatric teaching must be given as pædiatric education and form part of the curriculum of pædiatrics for areas less happily endowed than our own.

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THE PLACE OF TAPE RECORDINGS IN MEDICAL COMMUNICATION*

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THE TOPIC "The Place of Tape Recordings in Medical Communication" is an extremely difficult one. There is an increasing literature on the use of this medium in primary and secondary schools and even in junior colleges, particularly in so-called language laboratories. On the other hand there is an almost total absence of scientific study on the tape recorder at a professionl level of instruction. The art of listening, too, has been a neglected field of critical investigation. The impact of mass auditory communication media such as the radio, the motion picture and television has, however, stimulated some extremely interesting studies of this language art in recent years.

It is not my intention to dwell on the many unanswered questions in connection with verbal communication, interesting as they may be. This explanatory note is inserted only to indicate why this paper is, of necessity, based on personal observation viewed against the backdrop of a very limited recorded knowledge of auditory communication skills.

FUNDAMENTAL PRINCIPLES OF COMMUNICATION

Before dealing with tape recordings as such, it would probably be valuable to review certain fundamental principles which are applicable to communication of all types. We are indebted to Ter Louw[6] for his simplified classification of these factors. They must be constantly kept in mind in any attempt to assess critically any mechanical aid to the communication process.

1. The first of these is *Isolation or Elimination of "Noise"*. Ter Louw defines noise as any stimulus, visual, auditory or otherwise, that is not directly related to or an integral part of the teaching message. Occasion will arise later on to indicate examples of noise when the term is used in this sense.

2. The second is the all-important *Pupil-Teacher Relationship*. Given an audience and a lecturer, one's initial attitude by habit is one of attention to the lecturer. However, maintenance of attention is not a habit and is strongly affected by the respect and esteem in which the lecturer is held by the audience. It is well known that when the lecturer is absent and his presentation is made by various mechanical aids a successful presentation calls for intensification of all methods used for controlling attention over and above those necessary for an equally successful personal presentation.

3. The third point is the *Intensity of the Stimulus*. This fact requires little comment. Auditory or visual stimuli, whether emanating from a person or from a mechanical device, must exceed a threshold level of intensity, clarity and legibility or they function as noise.

4. The fourth point is *Sensory Saturation*. It is obvious that if all sensory perception, both visual and auditory, can be captured and retained by the lecturer and focused on the point at issue, audience reception will be intensified. If, when one speaks, the visual sensorium of the audience is captured by slides used to complement the words, the interest of the audience is maintained. If, on the other hand, the slides are for any reason a detracting influence, they function as noise.

5. The fifth point is *Involvement*. Our capacity for passive absorption of information is limited. The aim of a talk must be to challenge the listener to become involved in the message. You have probably noticed in listening to certain lectures that the presentation of a point with which you

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disagree, or a technique which with modification you could use personally, has called forth greater attention and retention of the material on your part. You have become involved.

Assessment of Tape Recordings

It might be well, even at this stage in our discussion, to take a look at how tape recordings, used as the sole means of communication, stand up to assessment by this yardstick. Taped presentations have four major theoretical disadvantages:

1. At a signal intensity well above threshold, "noise", in the sense previously referred to, often detracts from reception with the machines available to us.

2. The pupil-teacher relationship is difficult to maintain, as previously pointed out.

3. Sensory saturation is not achieved, since irrelevant visual sensations continue to impress themselves upon the sensorium.

4. Involvement is more difficult to obtain, since the presentation is incapable of modification during its course on the basis of audience response.

In case some of you may feel that this judgment is too harsh, one should add possibly that we are comparing tape with a theoretically perfect medium of communication. The printed word, for example, also fails on at least three of these same five points.

With this theoretical introduction to our subject we can pass on to three practical situations in which tapes are being, or could be, used in medical education.

TAPE RECORDINGS IN THE EDUCATION OF THE EDUCATOR

It is a curious phenomenon that the voice that a person hears most often—his own—is the voice that he is least familiar with. Opinions about the fidelity of reproduction with tape recordings vary. However, people are generally agreed that they record faithfully all voices except their own, which is invariably quite unrecognizable.

The voice of a teacher has been said to be the hallmark of his personality and, as such, it can be his greatest asset, or conversely his greatest handicap. In this day, when so much of our medical education—undergraduate and graduate; in classrooms, conferences and conventions—is by the spoken word, every attempt must be made to guarantee the excellence of verbal presentation. It has been shown in the field of general education that the tape recorder is a most potent ally in the analysis of and correction of faulty verbal presentation. It is high time that medical educators and speakers began to utilize this technique for self-improvement. A majority of medical presentations would doubtless undergo startling and extremely valuable revision were the authors exposed to a preliminary play-back and critical cross-examination of their own recorded words.

Here, then, is a startlingly simple application of the tape recorder to the very roots of medical education—a proved tool in the education of the would-be educator.

TAPES AS AN ADJUNCT IN LECTURES AND CONFERENCES

My second consideration is the use of tape recordings in connection with lectures and conferences.

I well remember the stimulating panel on the treatment of multiple trauma, chaired by Dr. Robert Tidrick at the sectional meeting of the American College of Surgeons, in Des Moines last year. The initial portion of the presentation was on tape. It centred around the activity in the emergency department at the time of admission of a patient with multiple traumatic wounds. Set against this background of activity so familiar to all of us, one heard the brief urgent telephone consultation between Dr. Tidrick and his resident regarding the status of the patient and the therapy initiated and contemplated. This taped presentation, supplemented by coloured slides and Dr. Tidrick's remarks, created a "You Were There" situation which caught audience attention and sustained enthusiastic interest in the panel discussion.

Tape is an extremely valuable storage medium for auditory stimuli which cannot be reproduced on demand. For the reasons previously referred to, we do not feel it to be a satisfactory medium as the sole method of communication. However, it has certain inherent features which make it extremely valuable as an adjunct. Short, taped, auditory experiences, if of sufficient intensity, appropriate content and technical excellence, can significantly add to the interest and involvement of the audience when integrated into a discussion basically presented by more conventional modes of communication.

Tapes, too, have an additional advantage not shared by many of the newer communication aids. The equipment needed for production is not astronomically expensive, does not require highly trained personnel, and for the most part is already available in medical schools.

TAPE SUBSCRIPTION SERVICES

The last subject with which I should like to deal briefly is tape subscription services.

Since some may be unfamiliar with this term, I might say that a tape subscription service is a central agency to which doctors may subscribe by payment of a fee, just as one subscribes to a medical journal. The agency, in return, prepares tapes and distributes them, usually at monthly intervals, to subscribers. The tapes contain verbal reports, often transcribed by outstanding practitioners in the field, on a wide variety of medical subjects. One may subscribe to recordings covering one of the specialized fields of medical practice,

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as for example surgery, or to a service giving a more general coverage of the whole field.

Tape subscription services have enjoyed very limited success in our province and therefore a valid personal assessment is difficult to make. In addition, a search of the literature has failed to reveal a single article in which a critical analysis has been carried out concerning the effectiveness of tape recordings as compared with the written word in graduate medical education.

For this reason it would appear valuable to introduce this topic by refreshing your memory on the available knowledge of listening comprehension as compared with reading comprehension.

It is interesting to note that in spite of the fact that the average adult spends 45% of his communication time listening and only 16% of his communication time reading, by far the greatest emphasis in educational research has been on reading skill. It is estimated that well over 3000 studies have been reported on various phases of the reading art, yet Anderson was able to collect only some 50 investigative papers on listening. While the results from these studies on listening are often conflicting and inconclusive, there would appear to be rather good evidence to support the following conclusions:

1. In the adult, from about the Grade VII level on, reading comprehension excels listening comprehension for immediate recall.

2. However, the superiority of the written word over the spoken word is lost, or at least greatly reduced, if delayed recall is tested. These tests have usually been based on an interval of from two weeks to two months.

3. The greater the difficulty of the material presented the greater is the superiority of reading comprehension.

4. The greater the intelligence of the subject the greater is the superiority of reading comprehension, though listening comprehension is also increased the greater the level of intelligence.

It would appear that one must accept, as reasonable, the application of these general educational truths to medical education and conclude that, for a given expenditure of time, the rewards in terms of retained information will be greater if the doctor reads a journal than if he listens to a tape.

One must conclude therefore that theoretically, on the basis of available information, learning by tape is inferior to learning by reading. However, the comparison cannot end there. At the moment at least the material available to the profession on tape is highly selective and does not suffer from the ever increasing journalistic menace of increasing quantity and decreasing quality. It is impossible to lay the blame for this situation at the foot of any one monster, but among the many factors that force authors into print one might mention:

1. Pressure by fund-granting bodies who imply, if they do not state outright, that continued financial support is strongly influenced by the papers accepted for publication.

2. University faculties and medical societies who, by implication, judge suitability for promotion or for high office on the basis of the number of papers accepted.

3. Personal pride.

As long as this situation persists, the average medical practitioner may well spend hours trying to find a suitable article in a journal, while in a tape library authoritative material is at his finger tips.

CONCLUSIONS

Yardsticks are now available for the critical assessment of the excellence of any communication situation. We must train ourselves to use them.

Tape recordings fall far short of the theoretically perfect medium when used as the sole means of communication.

Among the many applications of tape recordings to medical education three have been briefly discussed. The conclusions drawn indicate that: (1) Tapes are without equal as a means of improving speaking skill. (2) In certain situations tapes may be valuable adjuncts to the lecture-conference type of presentation. (3) The value of the tape subscription service is, as yet, incapable of final assessment. A few of the considerations in this assessment have been dealt with.

REFERENCES

1. ANDERSON, H. A.: *Elementary English*, **29**: 215, 1952.
2. COREY, S. M.: *J. Educational Psychol.*, **25**: 459, 1934.
3. HAMPLEMAN, R. S.: *Educational Screen and Audio-Visual Guide*, **37**: 175, 1958.
4. MARTY, F. L.: *Ibid.*, **37**: 176, 1958.
5. RICHARDSON, J. E.: Active teacher: Training and assessment; Routledge & Kegan Paul, Ltd., London, 1955.
6. TER LOUW, A.: Improved instruction through better communication; Proceedings of the American College of Radiology, Annual Conference of Teachers of Clinical Radiology; 1957, p. 3.
7. WITTY, P. A. AND SIZEMORE, R. A.: *Elementary English*, **35**: 538, 1958.

TEACHING VS. RESEARCH

In the life of a university department the interests of research and of teaching are competitors . . . The activities themselves are in necessary conflict in any department which thus seeks to serve two masters. The activities compete for room space, for the working time of staff members, including mechanicians and secretaries, for funds, and for the control of faculty appointments . . . In my experience the demands of teaching and of research have been in continual conflict for nearly 40 years, and I cannot remember that either function ever helped the other. Many a demonstration would have been better prepared and many a student better served if the urgency of some situation in the research laboratory (and the fascination of it) had not pulled in that direction. On the other hand, the continuous concentration that a research dilemma can demand was often broken up by the class bell. I would have done better at either one of these activities if I had kept out of the other, and I suspect that there are hundreds of scientific men who could give the same testimony. This is not a situation that we can take any satisfaction in but is just one of the facts of academic life . . . — From a speech by Paul Kirkpatrick of Stanford University, delivered at a meeting of the American Physical Society in New York (January 1959).

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TWO-WAY RADIO CONFERENCES FOR POSTGRADUATE MEDICAL EDUCATION*

FOUR YEARS OF EXPERIENCE WITH A NEW METHOD OF PRESENTATION

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THE POSTGRADUATE division of the Albany Medical College of Union University, located in Albany, New York, has during the past four years conducted an experiment in communications that has opened the door to a most effective and practical new method. We are not suggesting that our experience indicates the curtailment of methods previously used. We are proposing for serious consideration the potential application of our experience within other areas.

In beginning my explanation of our experiment, it is important for me to make sure that what we have done is not confused with either radio broadcasting or television. It is true that we use broadcast facilities, but here the similarity ends. I shall be speaking of our experiences with what is, in effect, two-way radio communications. I must emphasize that I am not speaking of radio broadcasting.

To understand clearly what we have done and the potentialities for the mechanism we are using, it will be necessary for me to state briefly just how our intercommunications are conducted. Actually, we have established the world's largest medical conference room—a medical conference room which potentially accommodates ten or twelve thousand physicians residing within an area of fifty thousand square miles. To accommodate these physicians, we installed a small radio studio at the Albany Medical College. There are five microphones feeding into a console where these microphone inputs are mixed and the audio transmission sent to our radio transmitter. In our instance, there is a transmitter at the Medical College which sends the radio waves forty miles eastward to the top of the highest mountain in the State of Massachusetts. The signals are received on this mountain top and are simultaneously transferred to our broadcast transmitter (a frequency modulated transmitter with a radio signal covering a radius of 150 miles). Any physician or group of physicians within fifty thousand square miles can hear what we are saying in our radio studio. At this point, the similarity with broadcasting ends. We have chosen certain hospitals within our broadcasting range, in which we have not only installed radio receivers so that they can hear us but have also installed frequency modulated radio transmitters so that we can hear them. The transmissions from these hospitals are beamed to our mountain-top receiver where they are simultaneously fed into the broadcasting transmitter. This means, then, that anyone listening to this radio station not only hears what is said in the radio studio but also hears what is said by any of the remote hospital groups.

In advance, we announce to the physicians the topic which will be discussed at a given time on a given day. During each conference hour we include a maximum of nine participating hospital groups. We limit the participation in this fashion because we would not have time to answer the questions and have discussions with each hospital if we were to include a larger number. Since we now have twenty-five participating hospitals, it is necessary for us to present each conference (on a given subject) three times during a one-week period. We include, of course, a different group of hospitals each time, although each time any physician within radio range may listen to this conference without participating.

Customarily, our two-way radio conferences are conducted from 12:00 noon until 1:00 p.m. This time was chosen so that it would not actually represent an additional meeting for busy practising physicians. The physicians can quite easily arrange to complete their hospital rounds at noon, assemble in the radio conference room, and participate in the conference. In many instances there are facilities so that they may have a light lunch during the radio conference.

We conclude the conferences at one o'clock so that these physicians will not be delayed in meeting their afternoon commitments.

There are usually two or more faculty members who present a given conference. These physicians prepare a concise review of the topic under consideration. This review rarely takes more than twenty minutes. At the end of this period, the participating hospital groups ask the faculty panel questions relating to the topic. In this way, the participating physicians, for more than half of the conference hour, are directing the discussion, so that they receive the information they most wish to have. In an ordinary radio broadcast it would be necessary for the faculty to try to determine what information the physician would most like to receive. With the two-way radio conference method, the physician himself makes the determination and, therefore, there is little wasted time and effort. Also, obviously, the program is thus more productive for the participating physician, since he is receiving the information he desires. Of course, the participating physicians are not limited to questions. They may enter the discussions, and take opposition to what has been said. Lively and interesting periods ensue.

To emphasize the ease with which the two-way communications proceed, I should mention that included in transmitting equipment of each participating hospital is a special button which, when

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pushed, immediately turns on a light in our radio studio. This light indicates the hospital giving the signal. This, then, alerts the physician-moderator at the Medical College to the fact that this group has a question or wishes to enter the discussion. In this way, the material being discussed at the moment has continuity with the discussions and questions coming from all the participating physician groups, and there is free and uninhibited interchange of information and ideas. It is, in fact, just as easy as it would be if all were seated within one small conference room.

I have spoken of the Albany Medical College two-way conference network. There is, however, another facet. We have transmitting equipment established in Boston, Massachusetts, in New Haven, Connecticut, and in Burlington, Vermont. These transmitters also beam their transmissions to our mountain-top broadcast transmitter. This means that we are able to use the faculty from Harvard Medical School, Boston University School of Medicine, Tufts University School of Medicine, Yale University School of Medicine, and the Vermont College of Medicine, in addition to the faculty at the Albany Medical College. We, thus, give our participating hospital physicians the opportunity to direct the questions to the experts in all six medical colleges.

There are many intriguing program methods which may be used with these facilities. Sometimes we will have an expert in Boston and one in Albany, each participating in the conference and answering the questions and discussions as they arise. Actually, we sometimes combine three centres, using, for instance, Yale, Boston and Albany. At other times, we will have some of the specialists within the participating hospital groups join the Medical College faculty in a round table discussion of, for instance, "The management of gastro-intestinal bleeding," or some such topic as "The management of the hypertensive patient." We conduct clinical-pathological conferences. Duplicate protocols and sets of coloured photographs and slides are obtained. These are sent in advance to the participating hospitals and everyone in the conference has the opportunity of studying the protocol in advance. During the conference all look at slide number one at the same time, etc., so that there is no lack of visual material during these conferences. Outlines of the initial presentations, charts and graphs are mimeographed and distributed in advance to be given each physician in the hospital groups at conference time.

What have been the results of this communication method? First of all, we have been able to gain much larger participation from the practising physicians than we can by any other method. Five times more physicians participate in our two-way radio conferences than we are able to attract to the medical centre for intramural postgraduate programs. In addition, this is all done with great conservation of time and expense for the faculty and the practising physician. Each participating hospital donates $500 a year toward support of the radio conference program but there are no additional expenses. The physician stays in his own local community at his own hospital. This is not an extra meeting for him since it occurs during the noon hour when he is usually not seeing patients and when he can have his lunch at the same time. This is an active participation conference, with the practising physician an integral part of the conference. There is no need for the physician to have someone cover his practice while he is absent, since he is in contact with his practice and can easily leave in case of emergency. There is no economic loss through separation from his practice or the expense of travelling to the medical centre. This saving in travel time is tremendous. If the physicians who have actually participated in our radio conferences during the last four years had travelled to the Albany Medical Center for the conferences they have attended, their composite travel distance would have exceeded one million miles.

What are the potentialities for this two-way radio conference method in other parts of the world? In my opinion, they are almost unlimited. In fact, I think the chief limitation might be that of one's own imagination. Financing should not be a limitation, since an entire network can be developed for a relatively small amount of money. A conference network such as ours, including twenty participating groups, can be put into operation in its entirety for a maximum of $50,000. This obviously represents an average expenditure of less than $2500 per hospital. If broadcasting facilities are already available, the network can be developed for approximately $25,000.

One might be able to obtain financial assistance from a number of sources. One such possibility involves the more enlightened pharmaceutical companies. In our own instance, we have received a very helpful grant-in-aid from E. R. Squibb & Sons, a Division of Olin Mathieson Chemical Corporation. This co-operation between medical education centres and the pharmaceutical companies represents a most encouraging attempt on the part of those involved to be of meaningful service to practising physicians.

How could you use this method at home? First of all, you might be able to use it as we have in postgraduate medical education, although there is no need to limit its use to graduate or postgraduate medical education. It might be feasible to use it in a fashion which we would not consider in the eastern part of the United States. For instance, we have no desire to use this as a consultation type of service, although there might well be areas where physicians remotely located could through two-way radio communications have constant contact with experts in medical centres and thus be guided in their management of their patients. In some regions this method might help

solve the great problem of the adequate distribution of physicians to more remote and thinly populated areas. If a young physician knew that he would not be out of contact with medical information and guidance from his more experienced colleagues, he might be more easily convinced to locate himself permanently in these regions where he is so badly needed.

I would like once again to emphasize that I am not speaking about radio broadcasting. Even though many physicians listen to these programs as broadcast programs, with no potentialities for their own personal participation, they do not find that these two-way conferences have the limitations of the usual broadcast. Since their colleagues are discussing the subject, asking questions and receiving answers, these men find that 75 to 90% of all the questions which come to their minds during the program occur to others and are asked by others, and they hear the answers. The programs are much more meaningful than they would be if they were of the customary broadcast type.

Another interesting point comes out of our experience. We have found that when we assemble physicians in person in a conference room, they are sometimes quite hesitant to ask questions; perhaps because they are somewhat fearful of exposing their own lack of knowledge to the scrutiny of their assembled colleagues. However, in the two-way radio conferences the questions come over the air anonymously. In the individual hospital groups, the physicians write their questions on 3 x 5 cards which are passed forward to the local moderator. He lines up these questions in front of him, deleting those which have already been asked, and submits new questions as his turn arrives. Except for possible identification within the local group, there is no identification of the individual asking the question. The questions are, therefore, anonymous. We find that the physicians are less hesitant to ask questions when these circumstances prevail.

In conclusion, I wish to emphasize that we have a great deal of information which I have not tried to present. The Postgraduate Division of the Albany Medical College would like to make the details of our experiences available to any who are interested, and would welcome personal contact or communications.

COMMENTS ON THE TEACHING OF PREVENTIVE MEDICINE IN CANADA*

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THIS PAPER is primarily a discussion of the differences in the content of courses in preventive medicine, public health or social medicine in Canadian medical schools, and the effect of these differences on the examinations of the Medical Council of Canada. There have been criticisms on several occasions and from various sources over the past decade to the effect that the content of courses in this subject varies widely from one school to another; that some are devoting too much time to "old fashioned" methods and to health problems long since solved; and especially that candidates for the Medical Council Examinations do not know what to prepare for, and the examiners find it difficult to set a "fair" examination.

I intend to present the viewpoint, which I have expressed on other occasions, that the problem is not as serious as some critics suggest and that in any event more harm than good would be done by rigid standardization of the teaching of this or any other subject in the medical curriculum. If the day ever comes when Canadian medical education is geared to fit examinations, rather than the reverse, it will be the end of progress. Nevertheless, the problem deserves careful study.

To start with, let me present two dogmatic statements.

1. There is just as much difference in the content of courses in preventive medicine as there is in courses in medicine, surgery, and obstetrics in Canadian medical schools; no more, no less, give or take a few decimal points. And apparently, rather less variation than in psychiatry and pædiatrics.

2. This variability in the content of courses is a good thing and should not be stultified by the deadening hand of mediocrity in the guise of standardization—above all else, standardization designed solely to assure success in the Medical Council examinations.

Since the subject of preventive medicine has come under scrutiny in this regard several times, I can only infer that others are not as convinced as I am on these two points.

PURPOSE OF MEDICAL COUNCIL EXAMINATION

To decide whether a problem of any serious magnitude really exists calls for a definition of the purpose of the Medical Council examinations. This purpose would seem to be the determination of the candidate's ability to practise general medi-

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cine in Canada. If this assumption is correct, the examination should test a candidate's basic and practical knowledge of problems which it would be the responsibility of the Canadian general practitioner to deal with. He should also be expected to know what specialty services are available, to which he may refer problems beyond his ability, or from which he may obtain assistance; and also to know how he can make most effective use of these specialty services. This requires a general knowledge of the scope of each specialty and the broad principles on which the specialty is based. However, it does not require detailed knowledge of the techniques ordinarily carried out by the specialists.

It has been argued that in some provinces general practitioners are appointed as part-time public health officers, and therefore, medical students should be taught the details of public health procedures and practice. The same argument can be applied to the teaching of radiology, anæsthesia and most other specialties. General practitioners may, under certain circumstances, have to serve in lieu of a specialist when none is available in the community. However, it is usually accepted that, under such circumstances, the general practitioner should take additional medical training, at least a short practical course, from a specialist in the subject. It is recommended that the same should apply in the case of a part-time health officer.

The magnitude of modern medical knowledge makes it impractical for medical schools to accept responsibility for teaching specialty subjects "in miniature" as part of the undergraduate course, in order to meet the needs of the minority of practitioners. Furthermore, to do so would not be in the best interests of the public or of medical practice.

It is, therefore, concluded that public health should be recognized as a specialty of medicine. Undergraduate teaching should cover only the general principles of public health, giving the student a general knowledge of the role of the specialist, and an understanding of how the clinical practitioner may make use of his services for the benefit of the patient, or co-operate with the specialist in a community health program.

It follows that the written, clinical and oral examinations of the Medical Council of Canada should be primarily devoted to preventive and social medicine, and should include only general questions on the principles of public health.

At the meeting of the Association of Canadian Medical Colleges in 1951, certain points were emphasized which, I think, are still valid:

1. Having a student understand the role of the clinician in the promotion of health in the prevention of disease is of paramount importance. Teaching of the methods and techniques of clinical preventive medicine should be as detailed as that of the methods employed in diagnosis and treatment. The responsibility for preventive medicine should not be shouldered off on to the public health department.

2. The importance of helping the student acquire an understanding of the environmental and social factors affecting the incidence and progress of disease was emphasized, and of their effect also on treatment and rehabilitation of the patient. An understanding of the integration of preventive, clinical and rehabilitational programs is important, as is the use of both personal and community resources in the practice of comprehensive health care.

3. An understanding of the general principles of public health practice is necessary, but not of the detailed methods used by the specialist.

Several speakers at that meeting, especially Dr. Hobbs and myself, criticized the examinations of the Medical Council of Canada for giving too much emphasis then, in 1951, to details of public health practice such as sanitary engineering. The Association of Canadian Medical Colleges at that meeting passed the following resolution: "Resolved that the Association of Canadian Medical Colleges go on record as recommending to the Medical Council of Canada that examinations in public health should be of a more general nature and should emphasize the clinical and social aspects of illness."

The Medical Council of Canada heeded this advice, reorganized its examining board by adding several who were not practising specialists in public health, and forwarded the resolution to the chairman of the main board of examiners with the request that he bring it to the attention of the examiners.

EXTENT OF DIFFERENCES IN CANADIAN COURSES

Leaving aside the matter of Medical Council examinations for the moment, let us consider the extent of differences in the courses in Canadian medical schools. Let me hasten to say that these observations are not based on a scientific survey. I have already expressed my dislike for questionnaires and I have not imposed another on the professors of preventive medicine. However, I have reviewed the descriptions of courses in the twelve calendars or catalogues of Canadian medical schools, and some information has also been obtained from personal discussions with teachers of preventive medicine.

Here are some statistics which are perhaps no less meaningful than many which have passed the editorial blue pencil.

Name of the department	*Departments*
Preventive medicine	4
Hygiene	2
Public health and preventive medicine	2
Social and preventive medicine	2
Health and social medicine	1
Psychiatry and preventive medicine	1

This variation in naming suggests greater differences than are mirrored in the description of the actual courses, although the names do, without doubt, give some indication of emphasis. The department, by whatever name it is called, has three main functions, any one of which may receive greater emphasis in a specific school. One aspect is the study of social and environmental factors which may affect health favourably or unfavourably, which may cause disease or disability, or which may influence the outcome of treatment and rehabilitation. This function is the prime reason for the existence of a separate department with a staff trained in epidemiology. Very few, if any, of the staff members of other clinical departments have the requisite knowledge to do justice to it. The two other aspects of the department's work are in the application of measures for the promotion of health and prevention of disease: firstly, the community-wide program, usually designated by the term "public health"; and secondly, the individual program of preventive medicine, most frequently provided by the clinical practitioner in general practice or in a specialty such as pædiatrics or obstetrics.

The terms social medicine, public health and preventive medicine may give some indication of emphasis on the three phases described above, but in fact the name is largely a matter of personal preference on the part of the professor. Names have often changed with a new appointment to the chair. The term "hygiene" has for the most part been dropped by the English-speaking schools which once used it, partly it seems because it lost favour as the public came to limit "personal hygiene" to a rather narrow aspect of health care. The French term "hygiène" has apparently retained its original meaning and status, and is the title of the department in the two French-speaking medical schools in Quebec.

THE YEAR IN WHICH COURSES ARE GIVEN

Data are available on only ten schools. The description was incomplete in two calendars.

Year in which Courses are Given	*Schools*
First year	4
Second year	7
Third year	9
Fourth year	9
Expressed in another way to show the overlapping, we have:	
Courses in first, second, third and fourth years	3
Courses in second, third and fourth years	3
Courses in first, third and fourth years	1
Courses in second and third years	1
Courses in third and fourth years	1
Courses in fourth year only	1

SUMMARY OF CONTENT

In the four schools which have teaching in the first year the subjects are as follows:

Subjects taught	*Schools*
Social trends; biostatistics	2
Nutrition	1
Student health service	1

These courses might well be described as an introduction to medicine, not solely to preventive or social medicine. They are, however, given by that department.

The courses in second, third and fourth years differ more in their timing than in their total content. Of the seven schools which have teaching in second year, five cover almost all of the following subjects: general principles of epidemiology; epidemiology and control of communicable diseases by public health or community measures; sanitation of water, food, milk; vital statistics; industrial medicine; housing; school health; nutrition; and the health department's services and administration. The course in one school covers only communicable diseases in the second year, and another only statistics. I think it is fair to summarize these courses in the second year as covering the general principles of social and preventive medicine, and the community or public health programs, the first two of the three fields of responsibility described above.

The third year is devoted to clinical preventive medicine, that is, to preventive measures which are largely the responsibility of the general practitioners or clinical specialists. Subjects specifically mentioned in many catalogues are: tuberculosis control, acute communicable diseases, immunization, maternal and child health, chronic degenerative diseases, industrial medicine, cancer, mental diseases, and addictions. Several schools also devote some time to medical economics, health insurance, or systems of practice.

In those schools which have no course in second year, that of the third and fourth years covers much the same general topics listed above in the three fields of social medicine, public health and clinical preventive medicine.

One very honest professor describes his course as devoted to those aspects of prevention not covered in the courses of other departments. I am sure this is, in fact, the case in most schools. Much of the clinical preventive medicine is covered in pædiatrics, medicine, obstetrics, psychiatry and surgery, as indeed it all might be. Unhappily, however, it is often given much less emphasis than the professor himself is aware of. This is not really surprising. The teachers in these departments are used to dealing day by day with ill patients, and the problems of diagnosis and treatment loom large. They know that prevention is important, but they spend so much time teaching the methods of diagnosis and treatment that prevention is often barely mentioned. It is the job of the department of preventive medicine to stimulate interest and participation in this subject, and to supplement the teaching when necessary. The department also carries

major responsibilities for covering the basic principles of social medicine and of community health services.

VARIABILITY IN THE CONTENT OF OTHER CLINICAL COURSES

Without going into detail, I would suggest that the university catalogues reveal a wider range of content and of timing in the courses in psychiatry and pædiatrics than in preventive medicine. Some schools have courses in these subjects every year of the four, and some concentrate them wholly in the third or fourth year. Even in medicine, surgery and obstetrics, the time the course begins, the degree of emphasis on methods of physical examination, laboratory medicine, bedside teaching, class clinics and lectures, clinical clerkships, etc., and the use of different text books indicate at least as wide a variety of emphasis and of teaching methods in these subjects as in preventive medicine. In each of these subjects the teacher also has to contend with the problem of emphasis on general principles and on methods used by all practitioners, without undue detail of techniques which would be employed only by specialists. He must, nevertheless, acquaint the student with the extent of the services which may be provided by the specialist.

All of this variation is, I believe, as desirable in preventive medicine as in the other subjects. The teacher learns that he can convey certain ideas and principles through using one type of datum, or case, or method. Another adopts a different route to achieve the same goal. All have to contend with the huge and growing mass of material and must deal with it selectively. The departments of medicine and surgery would not be too surprised or concerned if a question appeared on the Medical Council examinations that had not been mentioned in the lectures or clinics, but had been left to the student's own studies.

It is true that the variation in content of courses creates some problems, both for the examiners and candidates, but the problems are in my opinion minor compared with those we might expect in the future, if we try to freeze our pattern by overstandardization. I think every one will agree that it is quite acceptable and desirable to have a minimum standard defined, a level below which a course must not drop or it would be unacceptable. This setting of standards is done by the Liaison Survey Committee of the Associations of Canadian and American Medical Colleges, and the Council on Medical Education of the American Medical Association. The setting of one pattern of teaching has never been attempted by this organization. If it were, exploration and research with new techniques, and new viewpoints would be prevented. The danger, it seems to me, lies in allowing any body outside the university to assume the power of saying that a course must be taught in a specific fashion and with a specific content. Yet it is only that type of standardized course which would meet the criticism of the student and the Medical Council examiner.

REVIEW OF THE MEDICAL COUNCIL OF CANADA EXAMINATIONS

As already indicated, the Association of Canadian Medical Colleges made representations to the Medical Council of Canada in 1951. In 1955, I reviewed the questions which had been asked in ten spring examinations of the Medical Council of Canada in the five years immediately following the resolution. Of the 50 questions, 38 had been on clinical preventive medicine, that is, on problems met by the practitioner in his daily work. Seven were on general subjects such as nutrition, dental health, health problems of an ageing population, accidents, mental health, and social and economic aspects of illness and overcrowding. Only five had been on sanitation or pasteurization, one on the sanitation of a rural home, one on a flooded area and one on a tourist camp. These five questions were all of a general nature and did not require a highly specialized knowledge of public health engineering.

My conclusion was that the Medical Council of Canada examiners had followed the recommendations of the Association with considerable success, but I felt that there might be a problem with some of the oral examiners in certain centres, who were practising specialists in public health, and who might still tend to give considerable emphasis to the detail of their specialty.

I have again reviewed ten examinations from 1956 to 1959 and attempted the same rough classification. I would say that 28 questions were definitely in the field of clinical preventive medicine, 16 were of a more general nature, and six were on sanitation. There has been a slight trend towards the more general question than those of applied clinical preventive medicine. However, I see nothing to criticize in this. The questions were almost without exception on matters which an educated physician should have some knowledge of. I would reserve judgment on only one question which consisted almost solely of a definition of certain vital statistics and the methods of calculation. I think a general knowledge of statistics is important, but primarily as an indication of health problems and as a guide to intelligent action by the doctor, rather than the fussy details regarding their calculation. This is usually carried out by a statistician in the department of health.

On the whole, the examiners of the Medical Council of Canada have asked the kind of questions that a candidate should be able to answer if he is to be qualified to practise medicine in Canada. I do not believe they expect students to learn the fine detail of public health procedure, which most practitioners in general medicine in Canada would not need to know in detail. Some of the oral examiners may expect such detail, and it is unfortun-

ate that more information cannot be obtained on the specific questions which they ask.

CONSIDERATION BY THE C.M.A. COMMITTEE ON PUBLIC HEALTH

The Committee on Public Health of the Canadian Medical Association, in 1955, had also taken an interest in the teaching of preventive medicine. They noted that the practice of medicine had changed in recent years. There is a lower incidence of communicable diseases, while the complex problems of the ageing population, accidents, industrial illness and many other problems have increased. They suggested that changes in the emphasis of teaching had not kept pace with the changes in practice. To some extent this may be true and it is always a problem which the clinical departments must face. Of course, there is no essential reason why the problems of an ageing population should not be considered in medicine and surgery, as well as in preventive medicine. However, the review of the calendars would suggest that most schools do call attention in their courses to the problems of chronic disease and the ageing population. In conjunction with the other clinical departments I think it likely that this aspect of the course is quite adequately covered. There are some schools, however, in which considerable emphasis is also given to the details of public health practice, but these same schools have more total time allocated to preventive medicine, and they do not slight the modern problems in order to present the more detailed course.

There is one point on which the field of preventive medicine may differ somewhat from other clinical disciplines. Although the emphasis may change, the older methods of prevention must still be taught, if we are not to revert to the days of epidemic diphtheria and smallpox. It may not be necessary for the physician and surgeon to teach bloodletting or mandelic acid therapy, because these were superseded by better methods. However, in the field of preventive medicine the old methods which produced results—sanitary engineering, immunization, etc.—must be maintained to hold our gains. Of course, we must branch out into new fields and discuss rehabilitation and the problems of chronic diseases, but we cannot always throw overboard the old in quite as clear-cut a fashion as in medicine and surgery. There may be a change in emphasis, but not a total change in content.

I must confess that I was never very much impressed with the argument that the diseases most commonly met in everyday practice should receive proportionately the greater share of teaching time. Arguments along this line are occasionally put forward to support the claim for more time in pædiatrics or psychiatry. If we based the time assignment in medical education on the frequency of certain types of diseases, we would devote more time to the common cold than to any other entity. The magnitude of the problems of cancer, the degenerative diseases, and arthritis are recognized, but it does not necessarily follow that the department of preventive medicine should spend a major part of its time on these problems. Emphasis has to be placed on those diseases which are preventable and on the methods which are effective. It is important that the student have the "know how" and the interest, which will ensure that the gains in the control of diphtheria and smallpox, tuberculosis and poliomyelitis are maintained.

In summary, the magnitude of modern medical knowledge makes it impractical for medical schools to attempt complete coverage of any field of knowledge, particularly the more specialized branches of medicine. Public health practice is a specialty. Undergraduate teaching should cover only the general principles, giving the student an understanding of the role of the specialist and how the services can be used for the benefit of the patient, and how the clinician may assist his confreres in community health programs. The Medical Council of Canada sets examinations to determine the candidate's ability to practise general medicine in this country, not the specialty of public health. It seems to be doing that with a fair degree of success. It emphasizes the basic principles of preventive and social medicine, but it requires specific facts or judgment on problems of prevention, which are ordinarily dealt with by the family physician. All Canadian medical schools, through either their department of preventive medicine or other clinical departments, direct the attention of students to such practical problems of prevention as well as to the general aspects of social medicine and environmental factors related to etiology or affecting treatment. Emphasis differs, because of differences in the viewpoint of the teacher, differences in health problems of the area, and for many other reasons. So long as the basic philosophy is presented—that the physician has a concern for health as well as for disease—such variations in presentation are of minor significance.

TECHNIQUES OF STUDY

The truth is that after primary school or prep school we never teach how to learn. Certainly at the university techniques of study are not taught. They are not taught because we do not know them. How many hours of reading represents the optimum, and what is the most efficient way of reading—continued attempts at recall or to read straight through? Are detailed notes kept and recopied essential, or are they time-wasters? If there is variation between students, what determines it? Is the ectomorphic introvert different in his optimal study requirements from the mesomorphic extrovert? We do not know these things, and here is a ready-made field for Operational Research. For what hours of wasted study time might not be saved and put to better use, academically or extracurricularly? — N. Malleson, *J. M. Educ.*, 34: 1147, 1959.

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THE PLACE OF SOCIAL MEDICINE IN THE MEDICAL CURRICULUM

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IN THE "PRESTIGE" rating of specialties amongst practitioners and students of medicine, "public health" has long shared the bottom two rungs of the ladder with its fellow, psychiatry. University departments of public health, where they have existed in more than name, have also suffered greatly from a multiplicity of names. Not only are many practitioners not at all certain that public health, or social medicine or preventive medicine is very important, but they sometimes do not even know just what a given department head in one of these subjects is professing anyway.

It is a tribute to the tolerance and openness of mind of the Dean and Senior Faculty of the Medical School from which I write that since arriving to open a new department of social and preventive medicine therein one and a half years ago I have never felt myself an outsider or felt the necessity of girding on that armour which in other medical school settings sometimes appears so necessary in order that someone in my position may fight a "battle" against his clinical and other preclinical colleagues. The title which I have chosen for this contribution is, I hope, as accurate as the title of any other discursive account of how one enthusiast sees his own contribution to the overall goals of medical education. It is in fact largely based upon what we are doing in one department in which the abbreviation "social medicine" is preferred to the abbreviation "preventive medicine", and which was started as recently as 1958, in one medical school which has not itself yet lived long enough to acquire more than a few grey hairs.

The department of social and preventive medicine at the University of Saskatchewan has two distinct, though not separate, functions:

The first, like that of any department of a medical school, is to contribute a share to the educational experience of the medical student (training, as it is generally accepted today, to be a "basic physician") drawn from that field of knowledge with which the department staff has supposedly special familiarity. The second is a somewhat special role of helping the student to apply and to understand the things which he has learned from other disciplines to "man in his social state".

While the first of these statements requires, for understanding by the general reader, an explanation of what we consider to be the area of knowledge with which we have special familiarity, the second requires some justification and a fairly detailed description of how its achievement is attempted.

In listing and briefly describing the four subject areas which together make up for us the subject of "social medicine", I am leaving to one side the wholly semantic arguments in which those of us who are engaged in its teaching spend so much of our time. I personally believe that the term social medicine is more apt than the range of others in common use: but do not consider that the things that I teach would be any the less meaningful, any the less interesting, or any the less "important", if they were called "public health" or "preventive medicine". I just happen to think that "social" embraces the totality of what we are trying to achieve more successfully than "preventive", and that the happily evolving divorce from the supremacy of sanitation and the drudgery of the drain is more easily accomplished if the fine old title of public health is, in the academic connection, given a few years' rest. Since "the public health" must be the concern of us all, we may well return to it one day.

There are four subject areas into which social medicine, as I construe it, can conveniently be divided: the medical student of today requires a degree of familiarity with them all.

1. *Epidemiology,* the study of mass aspects of disease (all disease, not just the infectious diseases), provides not only a research tool of as much importance in the unearthing of information about the etiology of ischæmic heart disease as it had in the early exploration of the etiology of cholera; its study also helps the student to understand properly the background of morbidity and mortality against which all the work of the physician and his colleagues in the health team must be performed. Having learned the elements of statistical technique early in his first year (in one of the preclinical departments), the medical student begins to see these applied to the study of the health of the community in the latter part of that year. In a series of lectures that are together called "background to medicine", he reviews population patterns and patterns of disease and death in the Saskatchewan and Canadian communities before going on in the second year to take up the descriptive epidemiology of the main infectious and non-infectious diseases with which society is afflicted. His learning about the epidemiological aspects of, say, heart disease, is linked as closely as possible to the beginning of his clinical and pathological experience in the same subject area. We are hopeful that in due course every subject which the student takes up in his systematic study of disease will be preceded by an introductory account of that subject's epidemiological features (which might be given from this department or from the appropriate other clinical department). In the case of the infectious diseases, teaching of preventive measures and control techniques is done at the same time as the epidemiology is reviewed,

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with an attempt at minimal overlap with the departments of bacteriology and pædiatrics.

2. *Health administration and practice*, which is "that body of knowledge which considers how medicine and the care of patients and the prevention of disease are organized and administered in present-day society", becomes more complex every day as our complex society evolves. We attach considerable importance to the understanding by the physician of today of the relative roles of those people who make up what is so often loosely called the health team. If the physician does not know in some detail the resources of the manifold divisions and sub-divisions of his own profession, the potential aid which he can receive from nurses of various kinds, from social workers and from all manner of therapists; if he is not aware of the great range of voluntary and statutory agencies currently operating in the health field; if he is not familiar with all the many methods of providing medical and hospital care through private action and through public and private insurance; and if he does not know the welfare resources of his community, he will not only be ignorant of some of the most significant changes in the character of medical practice, he will also be unable to obtain for his patient all that that patient needs and has available to him. In the third year about half of the 48 hours which each student spends in the department on 16 half-days is devoted to lectures and discussions on this topic.

3. *Environmental control*, which, for the benefit of the uninitiated, is really just a polite name for sanitation, has largely become the job of the sanitarian and the sanitary engineer. But even the physician who is not going to specialize in public health still needs to know something about it; partly because he may very well be faced with problems in this area if he is a rural general practitioner, but also so that he may understand something at least of the principles which lie behind those sanitary techniques which have played, and continue to play, so utterly fundamental a role in the promotion and preservation of the health of our advanced civilization. He should at least be aware that if, after graduation, he ever wants to shoot a pianist it would probably be safer (in terms of the number of likely consequent deaths) to shoot one who is also a surgeon rather than one who is also a sanitarian. Lectures in the principles of sanitation and environmental control are given a small place during one-quarter in the fourth year.

4. *The social aspects of disease*, construed as "the implications of the health state of an individual upon his social environment, and the role of his social environment in determining his state of health", remains the least understood division of the totality of social medicine. It is of course, to physicians, the area where many would say that the art of medicine and the science of medicine overlap. To say this is partly to deny the strides and advances made in recent years by the social or behavioural sciences: a denial we attempt not to make, through exposing our students to a sociologist who has applied his scientific knowledge exclusively to matters related to health for some years.

Here, too, we believe that the well-trained medical social worker has a role to play: this she does in the department's own third-year course, and, working closely with her physician colleagues, in a number of clinical settings through both third and four years.

It is in the area of the social aspects of disease and in the practice of so-called clinical preventive medicine—the good attention paid by every good clinical teacher to social factors and preventive possibilities in all his teaching—that doubts about the role of, or the very justification for, a separate department of social medicine are so often raised. In a paper of this length the argument against this viewpoint can hardly be expanded in full. It may suffice to ask the question whether "every good clinical teacher" who will remember to teach the pathological and biochemical background of every clinical case he demonstrates, would be prepared for like reasons to deny the role of a separate department of pathology or biochemistry.

In describing, albeit superficially, the topics which one department of social medicine deals with in its own subject area, I may have suggested already how closely that subject area itself touches upon almost any other specialty. To demonstrate, however, what I mean by the second responsibility of this department, I would allude to three types of teaching in which we are engaged at the present time:

(a) *The third-year project*: This is a group exercise, undertaken by groups consisting of three to four students, during the 16-week period that they are with the department in third year, each group under the supervision of a faculty member from the department of social and preventive medicine and one from one of the other clinical departments, designed:

1. To encourage the student to ascertain and describe means of preventing disease.

2. To encourage the student to become aware of sociological problems associated with disease, and to relate these to his clinical experience in the hospital and elsewhere.

3. To help the student to become aware of the role of the family doctor and his colleagues in the health team in handling these problems.

4. To help the student to become familiar with the application of the epidemiological method in the study of the prevention of disease.

The extremely comprehensive reports produced by these groups in answer to a somewhat complex guiding questionnaire appear to succeed reasonably well in the achievement of their objectives. To describe the technique in detail would require a paper to itself. Suffice it to say that this approach,

which appears to interest the student, has also provided invaluable opportunities of communication and improvement of mutual understanding for the faculty of many different disciplines which have now been involved in it. We hope constantly to be improving upon our present methods.

(b) Attendance by appropriate members of the department staff at the conferences, ward rounds and other teaching sessions of our colleagues allows us to put forward from time to time the appropriate sociological or epidemiological viewpoint, the attitude of the practising public health physician, the criticism of the one-time general practitioner, the doubts of the social worker, the educational approach of the public health nurse, or the observations of the hospital administrator. This range of possible contributions which we can offer, and which I am happy to say is welcome in a variety of teaching sessions given by a wide range of our faculty colleagues, is due, of course, to my good fortune in belonging to a department which consists of three full-time and five part-time members, in addition to being able to draw on the resources of a very capable department of social service.

(c) The use of the *general practitioner* in medical education is again a topic in itself. A compulsory period of two weeks spent in rural general practice at the end of third year does provide an opportunity for the student to observe the health problems of a community and the mode of life of a good general practitioner. It enables him to do more than this, of course: those attributes of continuity of relationship between the best kind of family doctor and his patients, as well as the very different range of diseases to which he is exposed, are invaluable to the student in his preparation for the practice of medicine. The general practitioner has now got himself involved in the social and preventive medicine course proper, as well as in the preceptorship program, and it is likely that further developments will take place. Certainly, he is a very real aid in helping the student to set all his learning against the realities of practice. Given a close relationship with faculty through a department of social medicine, as are some 17 of the general practitioners who teach our medical students, his role is likely to become more rather than less important.

In describing some of the teaching which we try to do in one new department of social medicine, I have had, perforce, to skim rather lightly over many details and I have not touched upon the very rewarding experiences which are coming as we develop a collaborative research program. At best, this account may have thrown some light on the place which that body of knowledge which I have called social medicine can contribute to the medical curriculum. I hope it may be that I have succeeded in demonstrating how one department attempts to make a meaningful contribution to the education of a physician able to take his place in modern society.

CANADIAN MEDICAL EDUCATION—ITS COSTS AND PERSONNEL

J. S. THOMPSON, M.D.,* *Edmonton, Alta.*

INTRODUCTION

THE COST of medical education is known to be high and many universities view their medical faculties as expensive, though necessary, luxuries. A recent questionnaire, covering the 1958-59 session and prepared by the Association of American Medical Colleges, but collected and first analyzed by the Association of Canadian Medical Colleges, gives certain information from which we may attempt to arrive at facts and figures dealing with both staff and students as well as with the financial picture in Canadian medical education. These data are presented here because of their obvious interest to medical educators and to the profession at large.* Some of the data included will also be found in the Education Number of the *Journal of The American Medical Association*.[1]

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STUDENTS

A total of 3672 undergraduate medical students, of whom about 8% were female, registered in the twelve Canadian medical colleges in the fall of 1958; and between July 1958 and July 1959, 859 individuals received the degree of Doctor of Medicine. This latter figure is significantly lower than the "over 900" usually given as the number of graduates in any one year. While speculation is always dangerous it would appear probable that, based on the number of students in the lower three years and the apparent attrition rate, the number of graduates will decline over the next two years. The total number of students in each of the four years across Canada is indicated in Table I.

Although the numbers of married students were not available in two of the schools, it would appear that, in September 1958, about 18% of all medical students in Canada were married. The percentages increase over the four years (as shown in Table II) until by the fourth year one student in three is

TABLE I.—REGISTRATION OF MEDICAL STUDENTS IN CANADIAN MEDICAL COLLEGES IN SEPTEMBER 1958

Year	*Male*	*Female*	*Total*
1	898	91	989
2	830	91	911
3	802	67	869
4	848	55	903
Graduates 1958-59	808	51	859

married (compared to two in three in the final year in the United States[1]). There is apparently no marked regional trend towards marriage among medical students in the different areas of Canada, but only about 9% of female students (or about half as many as males) are married and at least some of these are married to other medical students.

TABLE II.—PERCENTAGES OF MARRIAGES AMONG CANADIAN MEDICAL STUDENTS (BY YEAR OF THE COURSE)

Year of course	*Percentage married*
1	8
2	14
3	19
4	31
All years	18

About 10% of our students (a total of 362) may be listed as foreign students. Of these, 55% come from the United States while the rest are from 27 different countries, with the British West Indies, Hong Kong, Hungary, Great Britain, and China leading the list in that order. A total of 204 students come from the United States and thus some 50 students in any one graduating class may be expected to be American. This is far below the number of 200 or more graduates of Canadian medical schools that Struthers[2] estimates leave Canada for the United States each year, so that many of the larger total must be Canadians leaving their mother country.

The members of the faculties of our medical colleges are, of course, responsible for the training of many graduate students, a large percentage of whom are not graduates of medical schools. A total of 181 masters and 134 doctoral candidates were registered in 1958-59, and of the totals only one in four received a master's degree while one in three got a Ph.D. While speculation on the results of just one year is risky, it would appear that there may be too many "chronic" candidates for a master's degree in Canadian medical colleges, since an average of four years seems an unduly long period for obtaining it. The average time of three years for a Ph.D. is much more reasonable.

In spite of many, and often vigorous, protests, the faculties of medicine are usually responsible for a great deal of "service" teaching, a great variety of students from other faculties being registered for one or more courses taught by medical school personnel. In Canada last year the total number of non-medical students taught (3843) slightly exceeded the total number of medical students enrolled, However, most of these appear to receive only one course, or perhaps two courses, in the medical faculties and usually these students receive much less personal attention than do medical students. How great a weight should be given to this added teaching load, when computing the costs of medical education as a whole, is difficult to determine.

Graduate education in the clinical sciences is also the responsibility of the faculties of medicine, which last year assisted in the training of a total of 1317 interns and residents, with the latter slightly in the majority. This number is at best only an estimate, since some schools listed the house staffs of minor teaching hospitals while others confined their estimate to one major hospital.

FACULTY

For purposes of discussion, it is best to divide the faculty members into those in the basic sciences and those in the clinical fields. The numbers of full-time staff in these two divisions are found in Table III.

TABLE III.—FULL-TIME POSITIONS FILLED IN CANADIAN MEDICAL COLLEGES, 1958-59

Rank	*Basic sciences*	*Clinical sciences*
Instructor/Lecturer	59	66
Assistant professor	113	55
Associate professor	86	49
Professor	105	62
Unfilled positions	14	14

Basic Sciences (including pathology)

It should be noted that a total of 318 full-time positions at the level of assistant professor or higher exist in the basic sciences in Canada, and of these 95% were filled in 1958-59. Three-quarters of the basic science staffs are on full-time appointments and the remainder derive their incomes primarily from office practice or other non-university positions.

While it is now generally accepted that individuals without medical degrees can and do teach medical students in the basic sciences in a very satisfactory manner, it may come as a surprise to find that only 60% of the basic science teachers possess an M.D. degree (this compares with only 34% in the United States[1]), 3% possess no doctoral degree at all and the remaining 37% have a Ph.D. (or D.Sc.) qualification. The great majority of those without medical degrees are found in departments of physiology and biochemistry, with Ph.D.'s in the latter department outnumbering the M.D.'s by four to one, while in the former they are a slight majority. It should be added that about 12% of those with an M.D. (and classed with them in the above sentences) also possess a Ph.D.; thus

nearly one-half of the staff in basic science departments possess this advanced research degree.

Clinical Sciences

In 1958-59 there were 190 full-time positions at the assistant professor level or higher in the clinical sciences in Canada, of which 93% were filled. These were evenly divided between true full-time positions and so-called geographic full-time positions. The latter term refers to appointments in which the individual receives a large portion of his income from university salary and over and above this is allowed earnings (usually limited) from consulting practice. It is apparent that the trend to full-time staff in the clinical departments is well established in Canada, but these men are considered as a teaching and research nucleus only and make up only about 12% of the personnel in the clinical departments, although undoubtedly they provide much more than 12% of the teaching done. The great majority of the staff in the clinical departments are part-time teachers.

These part-time teachers are the bulwark on which medical schools depend for the major portion of the teaching to the medical students, and their importance increases over the years, instead of decreasing, as many doctors, and many part-time teachers, seem to fear. This part-time group makes up between 85 and 90% of the staff of clinical departments, and almost one-third of them receive no remuneration at all from the universities for their teaching duties. The other two-thirds receive small (often just token) honoraria for their part in the education of our students. Whether they lend their talents for so little monetary gain because of the prestige of being members of university staffs, or for the more altruistic traditions of the Hippocratic oath, or just because they like to teach is a question no man can answer.

In the clinical departments across Canada four staff members possess no medical degree, while a small percentage of those possessing an M.D. also hold Ph.D. qualifications.

THE COST OF FINANCING MEDICAL EDUCATION IN CANADA

An attempt to estimate the cost of producing one graduating M.D. must take into account a variety of factors, each so variable that the final estimate may have an error of 15 to 20%. However, it is felt that even this estimate is of considerable value in obtaining an overall view of the cost of Canadian medical education.

Almost as many non-medical as medical undergraduate students are taught by our faculties, but one school, with a large proportion of non-medical students, estimates that they can account for only about 20% of the total medical school budget. Part of the salary of each full-time clinician, perhaps, should be charged to patient service and not to education, but any estimate of true percentages is impossible and it can be argued that without this contact with patients the people concerned would not be satisfactory teachers. Some of the costs of both salary and equipment should be charged to research and not teaching, but again all would agree that research is properly part of the function of a medical school and that it is necessary to keep teachers from stagnating. With these provisos in mind, a look at the financing of Canadian medical education can be very enlightening.

Teaching Costs

The combined teaching budgets (not including grants in aid of research from all sources) in 1958-59 was approximately $12,800,000 for the 12 Canadian medical colleges. This sum includes salaries and current operating expenses, maintenance and utilities for the medical buildings but not the teaching hospitals, and also includes the intangibles of staff time devoted to research and patient care already mentioned.

If the 20% figure for the cost of teaching other students is applied to all Canadian schools, it would appear that the total cost of four years of medical education (not including pre-medical work) for each graduating medical student is at least $12,000 and of this the student himself, in his fees, pays only 20%. Endowment income and gifts account for approximately another 6%, and the rest comes from federal, provincial and local governments. Thus 74% of the cost of medical education is borne by government at its various levels.

The implications of the foregoing paragraph are rather startling. Each person who is accepted into medical school is really awarded a $9600 scholarship tenable over a four-year period, since this is the amount of the cost of his education not covered by his own fees. In other words, for every dollar he pays the university for the cost of his medical education the government pays the university nearly four dollars. Clearly, while some doctors strenuously object to any form of governmental interference with medical practice, they themselves were not averse to accepting substantial government aid in their own educations.

Research Costs

The 12 Canadian schools report that they received about $5,700,000 in research grants in 1958-59, and it is further reported that almost exactly two-thirds of this amount came from government sources. If this figure is related to the size of the graduating classes in the schools, it appears that in 1958-59 about $6700 per student in the graduating class was made available to Canadian medical colleges, for various types of medical research. This includes funds from such diverse sources as the National Research Council, the National Cancer Institute, the National Heart Foundation, the Defence Research Board, the Muscular Dystrophy Association, and other sources,

including many commercial firms, too numerous to mention.

CONCLUSIONS

Canadian medical education in 1958-59 appeared as a $18,500,000 venture spread over 12 university campuses and employing some 500 full-time personnel with a rank of assistant professor or higher. It also depended on over 1500 part-time teachers and served over 7000 undergraduates, half of whom were full-time medical students. In addition it took part in the training of well over 300 graduate students and assisted in the training of over 1300 interns and residents. Besides this it was responsible for most of the general and basic medical research carried out in Canada in that period, since other governmental and corporation medical research is usually of a strictly applied nature dealing with individual problems of prime interest to the sponsoring body.

REFERENCES

1. WIGGINS, W. *et al.*: *J. A. M. A.*, 171: 1507, 1959.
2. STRUTHERS, R. R.: *Canad. M. A. J.*, 78: 480, 1958.

CANADIAN SCHOOLS OF MEDICINE

The following statements supplement the general information regarding Canadian schools of medicine as published by the medical schools last year (the Journal, 80: 525, 1959). Full details are available on request from each school.—EDITOR.

DALHOUSIE UNIVERSITY
Faculty of Medicine

L. B. MacPHERSON, M.D., Assistant Dean

DURING the past year the Faculty of Medicine of Dalhousie University has continued its active program of teaching and research. The number of medical students registering in first year was the same as in previous years. There was an increase in the number of students registering in the Faculty of Dentistry; they receive instruction in the preclinical sciences in the departments of the Medical School. Since the enrolment in dentistry is expected to increase further, as well as that in the medical sciences and in various para-medical disciplines, the number of full-time staff in the pre-clinical departments has been increased during the year. There will probably be an increase also in the number of medical students within the next few years. Applications from students of the four Atlantic provinces who wish to enter in September 1960 are almost 50% above last year's figure.

Curriculum changes during the year have been of a minor nature. Medical Jurisprudence has been improved by the inclusion of lectures from the Faculty of Law. Toxicology has been absorbed into the regular Pharmacology course and is no longer a separate subject. The amount of "small group teaching" in the clinical subjects continues to increase and the number of didactic lectures to decrease. A chapter of Alpha Omega Alpha, honour medical society, was organized during the year.

All departments have an active research program. During the year the Cardio-Pulmonary Research Unit was extended with the appointment of a full-time director.

A large addition to the Pathology Institute, which will be ready for use in the autumn, will more than double the space available to the Departments of Pathology and Bacteriology. This building is being constructed by the Provincial Government. It is located adjacent to the Victoria General Hospital and provides for the university departments as well as the service laboratories in pathology and bacteriology. Extensive additions are also being planned for the Victoria General Hospital and the Grace Maternity Hospital and construction will probably begin in 1960.

LA FACULTE DE MEDECINE DE L'UNIVERSITE LAVAL DE QUEBEC

JEAN-BAPTISTE JOBIN, M.D., Doyen

AU COURS de la dernière année académique, le Comité du curriculum a été particulièrement actif. Il a entièrement réorganisé l'enseignement de la propédeutique en deuxième année et mis sur pied un enseignement intégré en ce qui concerne l'anatomie et la physiologie du système nerveux. Son activité se poursuit tant dans le domaine de l'enseignement préclinique que clinique. Par ailleurs, le département de médecine organise un cours complet de spécialisation en médicine interne qui se donnera avec la collaboration des hôpitaux affiliés à l'Université Laval.

Sur le plan de la recherche, la faculté a acquis, grâce à la générosité du Conseil national des recherches, un microscope électronique et s'est assurée les services d'un physicien, monsieur Jean Lafontaine.

En ce qui concerne le personnel de la faculté, le docteur Rosaire Gingras, antérieurement secrétaire, a été nommé vice-doyen de la faculté et le docteur Georges-A. Bergeron, secrétaire. De plus,

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la faculté s'est assurée les services de deux nouveaux professeurs de carrière, le docteur Paul Genest au département de pathologie, et le docteur Lévi Chouinard, au département d'anatomie.

UNIVERSITY OF OTTAWA
Faculty of Medicine
Ottawa, Ontario

J. JACQUES LUSSIER, M.D., Ph.D., Dean

DURING 1959, the Faculty of Medicine of the University of Ottawa considerably expanded its clinical teaching facilities by affiliating with the Ottawa Civic Hospital, a municipal institution of some 1200 beds. The Civic Hospital, which includes the Veterans' Pavilion and a communicable diseases unit, provides clinical experience for the third- and fourth-year students in various medical fields.

Financial aid available to students has also been increased during 1959 through the establishment of the Ontario Medical Association Loan and Bursary Fund.

Tuition fees have risen slightly, and are now as follows: pre-medical students, $400; medical students, $500.

Registration for 1959-60 is 265.

QUEEN'S UNIVERSITY
Faculty of Medicine
Kingston, Ontario

G. H. ETTINGER, M.D., Dean

FOR ADMISSION to the Faculty in 1960, the candidate must have Grade XIII matriculation standing, or equivalent, in English, a second language, physics, chemistry, at least two papers in mathematics, and, if a third paper in mathematics is not offered, an optional subject. With such qualifications, a student may be admitted to the first of the two pre-medical years. A limited number of students who have taken their pre-medical training elsewhere will be admitted to the first of the four medical years.

The fees are: sessional fee for pre-medical undergraduate, $385; for medical undergraduate, $500; student interest fee (including medical care), approximately $39; sessional fee for M.Sc.(Med.) and Ph.D., $275; D.M.R. fee, $275; degree fee, M.Sc.(Med.), $20; degree fee, Ph.D., $50.

The teaching hospitals in Kingston are: the General Hospital (501 beds), the Hôtel-Dieu (288 beds), St. Mary's Hospital (for chronic illness—116 beds), Ongwanada Sanatorium (for tuberculosis—160 beds), the Ontario Hospital (for mental illness—1500 beds), and the Canadian Forces Hospital, Kingston (125 beds).

The University maintains residences for men and women. Half of the freshman class and all the freshettes may expect this accommodation. The cost, for board and room, is approximately $19-$20 a week.

UNIVERSITY OF TORONTO
Faculty of Medicine
Toronto, Ontario

J. A. MACFARLANE, M.B., Dean

THE ANNUAL tuition fee in the pre-medical years has been increased by $43 and in the professional course by $58.

A new Division of Rehabilitation Medicine has been established within the Faculty. The present courses in Physical and Occupational Therapy, and in Speech Pathology and Audiology will come under its direction, as well as the teaching in physical medicine to the undergraduate students, and the training of graduate physicians who have a particular interest in this field.

The work of the Postgraduate Division continues to expand. In addition to the organized graduate courses which qualify students to sit the examinations of the Royal College, the various specialist groups offer short refresher courses for those in their own specialties, as well as others designed particularly for the general practitioner.

THE UNIVERSITY OF WESTERN ONTARIO
Faculty of Medicine
London, Ontario

J. B. COLLIP, C.B.E., M.D., F.R.S., Dean
G. E. HOBBS, M.D., Assistant Dean

THE TUITION fees are now $425 for each of the two pre-medical years and $625 for each of the four years in the Faculty of Medicine.

UNIVERSITY OF MANITOBA
Faculty of Medicine
Winnipeg, Manitoba

LENNOX G. BELL, M.D., Dean

A FOUR-YEAR diploma course in Psychiatry has been inaugurated by Dr. George Sisler, Professor of Psychiatry. This course utilizes all the psychiatric units in those general hospitals which are affiliated with the University, as well as mental hospitals under the Provincial Government Psychiatric Service.

UNIVERSITY OF SASKATCHEWAN
College of Medicine
Saskatoon, Saskatchewan

J. W. MACLEOD, M.D., Dean

A NEW division of hæmatology will be opened on July 1, 1960, in the Department of Medicine. It will be directed by C. W. Baugh, M.D., C.M. (Queen's), who has been appointed Assistant Professor of Medicine.

UNIVERSITY OF ALBERTA
Faculty of Medicine
Edmonton, Alberta

J. S. THOMPSON, M.D., Executive Secretary

MAJOR changes in the Faculty of Medicine in the past year concerned both the administration and the building program of the school. Dean John W. Scott retired on August 31, 1959, and Dr. Walter C. MacKenzie succeeded him in the Dean's Chair. A new clinical services wing at the University Hospital is rapidly nearing completion. This wing will include up-to-date out-patient facilities and offices for full-time clinical members of the staff, as well as numerous service departments of the Hospital. At the same time, a major addition to the Medical Building has reached the finishing stage, completion being expected late in the fall of 1960. This addition will provide greatly increased and improved space for the Departments of Anatomy, Biochemistry, Physiology, and Medical and Surgical Research, and animal quarters. It will also provide quarters for the Faculties of Dentistry and Pharmacy, and the Schools of Physiotherapy and Nursing.

UNIVERSITY OF BRITISH COLUMBIA
Faculty of Medicine
Vancouver, British Columbia

JOHN F. McCREARY, M.D., Dean

IN ADDITION to more than 500 beds at the Vancouver General Hospital which are assigned for teaching medical students, the facilities of Shaughnessy Hospital, St. Paul's Hospital, the Provincial Mental Hospital (Essondale), the Children's Hospital, and the G. F. Strong Rehabilitation Centre are used in clinical teaching.

CASE REPORT

RUPTURE OF THE SPLEEN AT THE AGE OF EIGHT MONTHS

D. H. ADAMSON, M.B., Ch.B., *Dutton, Ont.*,
R. J. BRISTOW, M.D., *St. Thomas, Ont.* and
G. H. VALENTINE, M.R.C.P.(Lond.), F.R.C.P.[C.], D.C.H., *London, Ont.*

RUPTURE OF the spleen is stated to occur at all ages, but is uncommon in young babies, except, possibly, in tropical regions. It is felt that this case is of interest on account of the young age of the baby.

A male, aged eight months, was standing up in his crib when the spring in the bottom of the crib collapsed. He fell between the crib and the spring which caught him under the costal margin. On arrival at hospital he was found to have a temperature of 102.3° F. and a pulse rate of 120. He seemed tender wherever touched and had bruises on his back, but no other abnormal physical signs. He had grunting respirations and was very pale.

Five hours later his hæmoglobin value was found to be 6.5 g. % and eight hours later 7.0 g.; the white blood cell count was 26,000. Good bowel sounds were present and normal bowel movements occurred. There were no signs of shifting fluid in the abdomen and a radiograph at this time showed a clear fat-line to the abdomen, no distension, and no fractured ribs but (unfortunately) suggested an early pneumonia at the right base.

Antibiotics were administered, but 24 hours later the baby developed abdominal distension. A radiograph revealed a distended stomach and a dense shadow in the left flank, with a loss of the retro-peritoneal fat-line on the left although it was still well marked on the right. After the stomach was emptied by suction the spleen was easily palpable. The hæmoglobin level was still 6.5 g.; temperature 102° F. and pulse 120.

The baby was given 200 c.c. of blood, and the abdomen was opened. A spleen completely ruptured into two parts was found, with free blood in the abdomen. The spleen was removed and after the rest of the abdomen had been inspected, the wound was closed in layers.

The postoperative course was uneventful and the baby made a good recovery.

It is frequently stated that a baby's spleen has an important function in the production of gamma globulin and that a baby without a spleen may be hypogammaglobulinæmic. This baby four months later developed a gastro-enteritis, which responded partially to antibiotics but did not clear completely until he was given a 2 c.c. dose of gamma globulin, when it cleared almost instantaneously.

SUMMARY

A case of ruptured spleen in an infant aged eight months is presented. The danger of hypogammaglobulinæmia following splenectomy in young babies is indicated.

SHORT COMMUNICATIONS

HEXADIMETHRINE BROMIDE AS A HEPARIN ANTAGONIST IN EXCHANGE TRANSFUSION*

G. H. VALENTINE, M.R.C.P., D.C.H., F.R.C.P.[C], *London, Ont.*

IN 1956, PEW[1] first recorded his experience of the use of heparinized blood for exchange transfusion and I described a technique in detail in 1958.[2] In the last three years, heparinized blood has become commonly used for exchange transfusions. My own experience has been most satisfactory. Since 1955, I have used only freshly drawn heparinized blood, and in some 70 exchange transfusions have encountered no problems whatever. There have been no anxieties for the baby's condition during the procedure, no problems of clotting, no sequelæ in those treated, and no mortality. Experience with citrated blood in former years was otherwise.

Replacement of the baby's blood with blood containing 1500 to 2000 international units of heparin for each 500 c.c. might seem to be inviting severe problems of hæmorrhage. Gaffney[3] has emphasized this possibility. In fact, the danger appears to be a possibility rather than an actuality. In 65 exchange transfusions with heparinized blood performed personally no hæmorrhage occurred, even though no steps had been taken to neutralize the heparin. However, since hæmorrhage, either external or into a body cavity or cranium, is a possibility, it is as well to know how to neutralize the circulating heparin, should the need arise. Pew used protamine, but does not mention its effects on the coagulation time. I have studied the effect of 1,5-dimethyl-1,5-diazaundecamethylene polymethobromide or hexadimethrine bromide (Polybrene), first used as a heparin antagonist by Preston and associates in 1956,[4] and studied pharmacologically by Kimura *et al.*[5] The results are here recorded.

It is not suggested that a heparin antagonist need be used routinely. It appears unnecessary; but for those who have not the courage of this conviction, or who might encounter hæmorrhage, this small investigation may be of help.

METHOD

The technique, described in 1958,[2] was followed exactly with one exception. Because of a move to a different hospital and the use of different commercially prepared equipment, the 500 c.c. of blood usually collected from a donor was taken into silicone-coated bottles containing 2000 i.u. of heparin rather than 1500 units. The change seems unimportant. Coagulation times were determined at the commencement of the exchange transfusion, at the conclusion, and five minutes after the measured dose of hexadimethrine bromide had been given. Two 8 mm. glass tubes were used at each determination. One c.c. of blood was collected from the umbilical catheter into each of the two tubes. Care was taken to ensure that the dead space of blood within the lumen of the catheter was discarded before the collections were made. One tube was allowed to stand and the other was inverted every 30 seconds until the blood ceased to pour from one end to the other. The time was noted. The second tube was then taken and inverted every 30 seconds in the same way. The time at which the blood failed to flow was again noted. The coagulation time was taken as being the mean of these two clotting times. At the conclusion of the exchange transfusion, and when the samples had been taken for determination of the coagulation time, the umbilical catheter was flushed of blood with one or two cubic centimetres of normal saline. In accordance with the manufacturer's suggestions, one milligram of hexadimethrine bromide was used for every 100 i.u. of heparin given. These patients all had received 2000 i.u. of heparin. Hexadimethrine bromide (Polybrene) is marketed as a sterile solution containing 10 mg. to the c.c. Two cubic centimetres of solution was drawn into a 20 c.c. syringe and normal saline drawn up to make 20 c.c. In the first three cases, this was injected very slowly, 10 minutes being taken for the injection. In the last three cases, the injection was made over a period of five minutes. No change in the condition of any baby was observed during the injection. Five minutes later, the final samples were collected after one or two cubic centimetres of blood had been allowed to drain from the umbilical catheter.

TABLE I.—EFFECT OF HEXADIMETHRINE BROMIDE ON COAGULATION TIME

Case number	*Weight in grams*	*Coagulation time before exchange, in minutes*	*Coagulation time after exchange, in minutes*	*Coagulation time after 20 mg. of hexadimethrine bromide*
1	3697	3½	∞	5
2	2760	2¼	∞	3¼
3	3244	4¾	∞	4¾
4	3690	5½	∞	10
5	2964	5¼	∞	6¼
6	2985	4½	∞	4

∞ = No clot formed after 30 minutes

RESULTS

The effect on the coagulation time is shown in Table I. A considerable reduction in the coagulation time is obvious in all cases.

SUMMARY AND CONCLUSIONS

While a heparin antagonist need not be used routinely in an exchange transfusion with heparinized blood, hexadimethrine bromide administered as de-

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scribed above is a safe and effective heparin antagonist for use in exchange transfusion of the newborn.

The hexadimethrine bromide used in this investigation was Polybrene of Abbott Laboratories Limited.

REFERENCES

1. PEW, W. L.: *J. Pediat.*, **49**: 570, 1956.
2. VALENTINE, G. H.: *Canad. M. A. J.*, **78**: 927, 1958.
3. GAFFNEY, P. C.: *Pediat. Clin. North America*, **1**: 283, 1954.
4. PRESTON, F. W., HOHF, R. AND TRIPPEL, O.: *Quart. Bull. Northwestern Univ. M. School*, **30**: 138, 1956.
5. KIMURA, E. T. *et al.*: *Toxicology*, **1**: 185, 1959.

THE MENTAL HOSPITAL PATIENT IN CANADA

E. F. W. BAKER, M.D., F.R.C.P.[C.], *Toronto*

THE PURPOSE of this article is to point out a fact too easily forgotten—that the mental hospital patient in Canda, 1960, continues *on the average* to receive inadequate accommodation and insufficient medical (including psychiatric) care.

Canada's *Official Handbook of Present Conditions and Recent Progress* (1958) states: "Treatment [of mental illness] has been hampered by shortages of qualified staff and by lack of adequate facilities . . . the provision of adequate mental health services remains a most severe problem."

TABLE I.

Type of institution[1,2]	*Cost of patient or prisoner per day*
General hospital	$15.11
Tuberculosis sanatorium	8.54
Chronic and convalescent hospital	5.77
Federal penitentiary	5.66
Mental hospital	3.69

The most recent available figures on hospital costs show that less money is spent on the patient in a mental hospital than on any other type of hospital patient. It is less well known that it also costs less to house and treat a patient in a mental hospital than to maintain a prisoner in a federal penitentiary (see Table I).

THE "CHRONIC" BACK WARD

The ward about to be described is perhaps not typical. But it exists; and the costs quoted above suggest that it is not a rare and exotic specimen.

Picture a long corridor crowded with 144 "chronic" male patients. Diagnostically, the patients are schizophrenics, manic-depressives, defectives, and organic mental syndromes. Length of hospital stay varies from a few days to (in one case) 60 years. Twenty patients are bedridden, the rest ambulatory.

The ward is staffed by not less than two and not more than five male attendants on any given shift. The psychiatrist visits the ward for about two hours twice a week. A psychiatrist-in-training spends an additional two hours on the ward. A nurse can be called from the infirmary for emergency parenteral injections. (She is also on call to any one of four other similar wards, in addition to duties on her own ward.) There is one social worker who is also shared by several other wards in addition to having other duties. There is no psychologist or occupational therapist available. There is no program of occupational therapy. There is one recreational therapist, who is shared by the entire hospital of over 1200 beds (all full).

On evenings, nights, week-ends and holidays, one doctor is on duty for the whole hospital.

Some half-dozen patients have ground or work privileges off the ward. About 20 are taken at a time for a walk around the hospital grounds, once or twice daily. Some others are taken to hospital concerts and church services. The rest never leave the ward, except in the unlikely event that they are conferenced and/or discharged; or for treatment of a medical or surgical emergency; or for terminal illness.

The washroom facilities typify the ward picture. For 144 patients there are two bathtubs, three showers, two urinals, four flush toilets and four wash basins. A local municipal housing by-law—which is mentioned as an interesting contrast—requires one flush toilet for every ten adults.

RESULTS

Patients who could be rehabilitated if given proper treatment remain on such a ward indefinitely—unwept, unhonoured and unknown. Careful investigation and treatment of each patient is impossible in these circumstances.

A second illness made up of "dysocialization and degradation" joins the initial mental illness and militates against recovery.

RECOMMENDATIONS

It is not the author's place to suggest recommendations. He wishes simply to state the problem and to leave it to the reader to propose solutions.

SUMMARY

This article attempts to show that there is still much room for improvement in the care of the patient in mental hospital. Mental hospitals are seen to compare unfavourably with federal penitentiaries in terms of cost per inmate per day. An instance is given of ward problems in mental hospital practice.

REFERENCES

1. Canada, Dominion Bureau of Statistics, Health and Welfare Division, Institutions Section: Hospital Statistics, Vol. 2, 1957, No. 83-203, Queen's Printer, Ottawa, 1958, p. 35.
2. Canada, Department of Justice: Annual Report of the Commissioner of Penitentiaries for the Fiscal Year ended March 31, 1958, Queen's Printer, Ottawa, 1958, p. 59.

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TEACHING COMPREHENSIVE MEDICAL CARE

In recent years we have all become familiar with the theme, "Medicine is becoming too technical." The individual patient, we say, is becoming lost amidst the laboratory tests: in our medical schools, the fact is bemoaned that we may be training a race of scientists, while neglecting that training in the human care of individuals which remains basic to the best practice of medicine.

Most medical schools, aware of the dangers inherent in a race of laboratory-oriented physicians ignorant of people though ultra-knowledgeable about diseases, have taken steps to prevent the occurrence of such dangers. The use of general practice experience, departments of social medicine committed to varieties of family care, observation of selected families through the years of training for the M.D. degree, carefully designed interdisciplinary teaching by physicians, psychiatrists and social workers . . . all these have been among the methods tried to offset the dangers of technical medicine.

In the United States the creation of special clinics in the setting of the teaching hospital, dedicated to the provision of what is called "comprehensive care", has had some favour. The General Medical Clinic of the University of Colorado has been one such project. Its incentive: "A feeling on the part of the Medical School Administration and Faculty that medicine and above all medical education, while they should not neglect the diagnosis and treatment of *illness,* should show more concern for the *individual* in *whom illness occurs.*" Its objectives: "To create an environment that would not only foster thorough and deliberate teaching and learning, but also involve students, faculty and patients in a clinic committed to the continuing comprehensive care of the individual and the cultivation of a patient-student-teacher relationship in which environmental, psychological and cultural, as well as pathological, factors would play a very deliberate role in the formation of medical judgments." Its method: a six-months' clinic experience for the senior student in a situation where he has maximal responsibility, involvement in a continuing relationship with the patient, opportunities for home visiting and access to consultation with a range of specialties, including psychiatry and social work, all in a clinic population drawn from a somewhat stable general population whose social characteristics are well known and well defined.

Dedicated to Dr. Ward Darley, former Dean of the Medical School at Colorado, and long a driving force behind the efforts of the Association of American Medical Colleges to develop the human and social aspects of medicine, an exhaustive and illuminating study of this project has now been published.[1]

The team of psychologists and other social scientists, internists and other physicians, with their nurses, social workers and other colleagues who have worked together on this project, are to be congratulated upon their application to two profoundly difficult tasks: firstly, for having achieved in the highly departmentalized atmosphere of the contemporary medical school and hospital, a clinic setting in which "total" medicine is most effectively practised and taught with the highest regard for effective interdisciplinary communication; secondly, for having subjected their technique to a most thorough evaluation.

The study is an exercise in the evaluation of a teaching technique of the greatest interest. The Colorado Faculty had the courage at the outset of this experiment to divide each of the three medical classes (1954, 1955 and 1956) into an experimental and a control group, and to assign students to these groups at random, with matching for class standing. With painstaking thoroughness they explore, in this study, the differing experiences of these two groups and their evolving attitudes and understanding. The study makes a large book, and while some of it will be of special interest to physicians in practice, some of special interest to medical educators alone, and some of interest only to the psychologists and social scientists whose techniques of measurement are being applied in specific cases, it is essentially an entity.

The range of subjects covered is wide, and observations relating to the acquisition of knowledge and to the evolution of attitudes in psychological and sociological areas are made. It is not possible to deal with all of these in turn. To the physician some of the factors explored which relate directly to the practice of medicine are, however, of special interest.

First of all, there is good evidence, probably as conclusive as such evidence can be, that what the authors call "acquisition of medical knowledge" was not, despite the fears expressed by many, in any way adversely affected by the different type of experience offered in the General Medical Clinic. Despite the fact that the students in it saw considerably fewer patients with specific organic

illnesses, and substantially more patients with "vague complaints" than is usual in the teaching hospital setting, and despite the fact that they spent what some might consider a disproportionate time on the social and psychological factors, there is no suggestion that what might be called their "regular medical skills" suffered in comparison with the control group.

The fact that the students' medical "knowledge" was not affected by the amount of attention paid to "attitudes" over that which was paid to facts, is essentially a negative factor. Since one of the most important purposes of the General Medical Clinic was to bring about a change in attitudes, the changes which occurred and the way in which the medical student looked upon the individual and dealt with problems in the area of human relations is of great interest.

When one looks at both student groups in the experiment, i.e. those who went through the General Medical Clinic and those who went through the "traditional clerkships", some significant differences do stand out. The "good" students, i.e. those with high academic standing and healthy personality characteristics, were also apt to be favourable to the concept of comprehensive care in the initial investigations carried out before the experiment began. These students, furthermore, were the ones whose attitudes changed in a positive direction during their experience in the clinic. There is good evidence to show that the clinic did have a positive effect on the "good" students and that it was not entirely unsuccessful with the poor ones. On the other hand, the attitudes of students in the regular traditional-type clerkship, measured by the same techniques, gave some valuable information. While some positive effects were detected on "good" students who were in the traditional type of clerkship, the latter had a negative effect on the poorer student—i.e. the fellow with less good academic standing, and personality problems of his own, appeared actually to have suffered in the course of the traditional type of clerkship in so far as the evolution of his attitudes to problems in the area of human relations are concerned. This is some confirmation of the often-expressed view that perhaps some aspects of medical education can sometimes result in an adverse effect on the motivation of our students.

Those who are concerned at the diminished responsibility of some medical students in some medical school settings today will find evidence supporting their concern, in the strong suggestion that the degree of personal responsibility which a student has for his patient's care has an important effect upon his attitude to that patient.

Much of what this study is looking at and trying to measure is in that intangible area of medical practice where science and art overlap. If the trend of medical education and practice towards the ultra-technical is to be corrected, if the man and not the disease is to remain the focal point of the physician's concern, we must so plan our education that it is focused upon people rather than upon organs, diseases and techniques. The Colorado study shows one way in which this can be done and the encouraging results that can come from it. We are pleased to note that since the conclusion of the three-year experiment all Colorado students have passed through the General Medical Clinic. In a few years we hope that it will be possible to see the results of further studies which may help us evaluate what kind of physicians resulted from this most worth-while experiment.

ALEXANDER ROBERTSON

REFERENCE

1. HAMMOND, K. R. AND KERN, F., JR.: Teaching comprehensive medical care: A psychological study of a change in medical education. 642 pp. Published for The Commonwealth Fund by Harvard University Press, Cambridge, Mass., 1959.

LAST CALL FOR THE QUESTIONNAIRE

The response to the C.M.A. Questionnaire on Health Insurance has been so satisfactory that we infer that doctors everywhere are glad to be afforded the opportunity to record their personal views on the important issues of today and tomorrow. However, to amass the composite opinions of the whole profession is a major undertaking which justifies the attainment of the highest response possible. Whether you are a graduate of last year or a veteran of many years' standing, a newcomer to Canada or a native, a salaried doctor or a practitioner, a teacher or a student, a C.M.A. member or not, you can contribute to this enquiry and we urge you to use your franchise.

It is necessary to establish a cut-off date for the analysis of replies, and questionnaires received by Friday, April 8, will be included in the compilations. All responses are being coded and transferred to punch cards. By the application of the latest devices for mechanical sorting, it will be possible to disclose the permutations and combinations of the opinions of all of us. We are very hopeful that the data compiled will be of the utmost help to your representatives whose duty it is to interpret your practices and attitudes.

To make this survey truly representative requires the aid of every doctor in the country. If you have not yet recorded your thoughts, please do so at once and make your return in the envelope provided to reach C.M.A. House not later than April 8.

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Men and Books

THE PHYSICIAN AND THE HUMANITIES*

The Rt. Hon. VISCOUNT SOULBURY, G.C.M.G., G.C.V.O., O.B.E., M.C.,
London, England

IN APRIL 1919, in his seventieth year, Sir William Osler, the Regius professor of medicine at the University of Oxford, wrote to a friend as follows: "I am struggling with an address which I hope you will like, as president of the Classical Association, a body composed of all the professors and teachers of Greek and Latin. Every other year they have an ordinary citizen—that is how I come in—but as Bryce, Morley, Balfour and Asquith are my predecessors, I am a bit nervous. I have a good subject, 'The old humanism and the new science'."

I can well understand his nervousness, for I was myself president of the Classical Association some ten years ago, and also, like Osler, an ordinary citizen. But comparing my own pedestrian and methodless musing on that occasion with his eloquent and erudite oration, I am amazed that I ever had the temerity to undertake the task.

The published title of Osler's address was "The old humanities and the new science", and it would be difficult to conceive a more important subject, though I am not quite sure what he meant by "the new science"—presumably it was the science which had given birth to the industrial revolution of our own times.

In any event the separation implied between the humanities and science prompts the question, "How did they ever come to be separated? Why and when was the scientist differentiated from the humanist?" Broadly speaking, science deals with the behaviour of things and humanism with the behaviour of man, and man and things are inextricably connected and interdependent. As Sir Maurice Bowra has said, "The knowledge of nature and the love of humanity cannot ultimately be kept apart." And yet it must be regretfully admitted that science and the humanities have been at odds for over two thousand years. Their divorce has bedevilled the progress of Western civilization, and disturbed the balance of education in its schools and universities for many centuries. Indeed it is only during the last few decades that signs of reconciliation have appeared, and no single individual has done more to reconcile them than Sir William Osler.

Before I try to develop this theme, I think it would be wise to take a brief look at the early history of Europe, for as Aristotle says: "He who sees things grow from the beginning will have the finest view of them."

But first of all what do we mean by "the humanities"? According to the Oxford English Dictionary, "the term includes various branches of polite scholarship"—I am not sure what impolite scholarship amounts to—"and comprises grammar, rhetoric and poetry, and especially the study of the ancient Latin and Greek classics". Grammar, rhetoric and poetry were the Trivium of education in the Middle Ages, and with the Quadrivium—arithmetic, geometry, astronomy and music—constituted the seven liberal arts. Known as a liberal education, these formed the standard course of study in mediæval schools and universities, which was based throughout on the Latin and Greek languages. But why did the study of science, theoretical or applied, in the spheres of physics, chemistry, biology, mechanics and medicine fill such a small space in that curriculum? Science, or natural philosophy as it used to be called, has been well defined as "the system of behaviour by which man acquires mastery of his environment". It is strange that the educationists of those days should have disregarded such an essential and vital department of study, and stranger still that some of that disregard should have persisted down to our own times.

Almost everything worth while in Western culture and civilization derives from two nations, Greece and Israel. But the discovery of the reign of law in nature was alien to the Hebrew mode of thought, and in the secular sphere, our group of nations is, as Professor Jaeger has put it, "Hellenocentric". The foundations of the theory and practice of modern science were laid by the Greeks between the years 600 and 400 B.C., and in Osler's words, "Like everything else that is good and durable, modern medicine is a product of the Greek intellect." For the first time in history, thinkers and technicians (there was no distinction between the two) from the cities of Ionia, on the shore of the Ægean—men like Thales and Hippocrates—commenced to substitute observation and induction and, to a limited extent, experiment, for myth and superstition.

Those two hundred years witnessed the birth of modern science and at that time any attempt to separate science from the humanities or to oppose theory to practice would have been, in the words of the president of the Royal Society in his address to the Classical Association last April, "incomprehensible to the great minds of those days". Indeed, if a thinker was unpractical, he laid himself open to criticism, as is evidenced by the story of Thales, who refuted that criticism by using his knowledge of astronomy or perhaps meteorology to make a corner in olive oil and a large fortune.

Nevertheless, signs of discord began to emerge from the Greek colonies in South Italy and Sicily. Pythagoras of Magna Græcia sought to blend science with religion and politics, and the immense influence of that remarkable man played no small part in forming the philosophical thought of Plato. Pythagoras exalted the abstract and the eternal at the expense of the sensible and perishable, and separated philosophy from the technique of production. Truth was to be sought for and established by pure reason and not by the senses, human knowledge was divorced from human practice, cosmological speculations took the place of inference from experiment, and observational science was discouraged.

This trend did not escape the notice of the author of one of the best and most famous works of the Hippocratic school—a work belonging to the fifth century B.C. entitled "Concerning ancient medicine"; perhaps Hippocrates himself was the author. "Medi-

*Read at the Osler Club of London, July 1959.

cine," he says, "has no need of an empty postulate, as do insoluble mysteries, about which any exponent must use a postulate, for example things in the sky and below the earth." He points out that there is no need of such postulates in medicine and goes on to say, "Certain physicians and philosophers assert that nobody can know medicine who is ignorant of what a man is, but the question they raise is one for philosophy; it is the province of those who, like Empedocles the Sicilian, have written about nature. But my view is that all that philosophers or physicians have said or written on nature pertains even less to medicine than to literature." This phrase, contrasting scientific procedure with literary accomplishment, seems to give an early indication of a cleavage between science and the humanities. The age of Hippocrates—the pre-Socratic age—encouraged a scientific and materialistic explanation of the universe. Careful observation, patient research and experiment—not abstract speculation—were the keys to the comprehension of nature.

The next age—the Socratic age—was dominated by the genius of Plato. He arrested the teachings of the Ionian school, and with consummate and unrivalled artistry substituted the metaphysics of idealism. It might well be said of him that his philosophy pertained less to science than to literature. Plato put a discount on the objective methods of positive science and a premium on logic and the verbal skill of the dialectician. His chief interest lay in human affairs, in the perfection, one might almost say the salvation, of man. His thought was concentrated on the immortality of the soul rather than upon an objective investigation of cosmic evolution. Ethics took precedence over physics. The management of man was far more important to him than the management of things. His metaphysical and religious conceptions of reality, reinforced by his immense prestige and the beauty of his style, did much to divert the stream of scientific thought into the *a priori* channels through which it flowed for the next two thousand years and more. This diversion was one of the main factors that established the pre-eminence accorded until recently to the so-called liberal arts—the *literæ humaniores*—in our educational system, and has produced in our country what Sir Cyril Hinshelwood has called "a curious lack of sympathy" between the natural sciences and literary and linguistic studies.

Forty years ago in his address to the Classical Association, Osler drew attention to the unequal dominance of the humanities in the academic life of Oxford, and made some criticism of the school of "Literæ Humaniores", commonly known as "Greats" and according to Gilbert Murray, "the most difficult and exacting of all courses of study at a university". He drew attention in his address to the neglect of the early Ionian philosophers in that school, and I fear that Plato must bear much of the blame for that. When I was an undergraduate, it was only too true that in Osler's words, "Few Greatsmen could tell why Hippocrates is a living force today." I cannot recollect any reference ever being made to him by my tutors, or to any of the great lights of ancient medicine mentioned by Osler. I diligently studied Plato's *Republic* and Aristotle's *Ethics*, but did not read a single word of the latter's biological works, or of his successor, Theophrastus, the founder of modern botany, except his "Characters" which had nothing to do with science.

Shortly before 1919, in a report to the Board of the Faculty of Arts at Oxford, a new honour school was proposed, the subject of which was to be the principles of philosophy considered in their relations to the sciences, and I imagine that the subsequent establishment of the Honour School of Philosophy, Economics and Politics, sometimes known as "Modern Greats", owed a good deal to the advice given by Osler before his death. Being curious to ascertain whether the older school of "Greats"—Literæ Humaniores—had taken note of his suggestions, I procured some of the most recent examination papers. They resembled in almost every detail the papers for which I had sat nearly 50 years ago. I say "almost" because in a paper on "Ancient history" I found this question (No. 10), "How far did the Ancients employ a scientific approach in the investigation of natural phenomena?" Here, I thought, Osler's advice has at last borne fruit. But there were 13 questions on the paper and the candidate was recommended to answer only three or four. How many tried to answer the tenth? I was reminded of the story of the visitor to a college chapel who, on noticing the ten commandments inscribed on a tablet in the wall, suggested that, following the example of the examiners in the schools, they should be prefaced by the instruction that not more than three need be attempted. In the other school, the school of Modern Greats, I could not discover a single reference to the Greek founders of science, and it was obvious that in reading for this examination, the candidates could have ignored them with impunity, and no doubt did so. It appears from the papers in the schools of Greats and Modern Greats that Plato's defeat of the Ionian scientists has made no small contribution to what Mr. Arthur Koestler has called the "cold war" between science and the humanities.

But applied science, or as T. H. Huxley preferred to describe it, "the application of pure science to particular classes of problems", suffered an even heavier blow not only from Plato who was not a scientist, but from Aristotle who was. It is to the immense influence of these two philosophers, and particularly Aristotle, on Western thought that we can ascribe much of the separation of technology from the humanities that has only commenced to disappear in recent times. Everyone's philosophy of life, however gifted he may be, is to some extent conditioned by his social background and environment, by the politics of his age and his outlook on the future. Plato and Aristotle were no exceptions. Plato was a rich man, an aristocrat, and a member of the ruling class in Athens, to which he was closely related. Aristotle, the son of a physician, was for about 20 years a pupil and disciple of Plato in his Academy; then, at the invitation of Philip II of Macedon, he returned to Stagira in his native country, became tutor to Philip's son, Alexander the Great, and occupied an important position at the Royal Court.

It is not difficult to infer from the *Republic* and *Laws* of Plato and the *Ethics* and *Politics* of Aristotle that the political and social unrest in Athens consequent upon the disasters of the Peloponnesian war, had filled both of them with grave apprehension of political and economic change, and with acute anxiety to preserve the predominance of the ruling class, and its ability to retain the leisure which was in their

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view essential to philosophic study. It would, I think, be possible to cite similar examples of anxiety throughout the ages and particularly after the upheavals of war. Indeed at the present day the problem of securing sufficient freedom from daily domestic chores to allow time for contemplation and study cannot lightly be ignored. It is therefore not altogether surprising that in constructing their model states Plato and Aristotle should have held that the survival of a leisured class was essential to intellectual and cultural progress. Accordingly in order to preserve the leisure of their class they found it necessary to justify an institution which had in their view hitherto made such leisure possible—the institution of slavery.

The arguments which they employed in support of that institution reverberated throughout Europe for over 2000 years and to some extent still pervert its educational and social values. Plato and Aristotle were in effect the originators of the venerable and mischievous prejudice in favour of the black coat and the white collar. Plato's metaphysical theory of reality implied that technique was less worthy of esteem than thought, and the status of the technician less reputable than that of the thinker. From that standpoint it was not a long step to the conclusion that for a man to do something with his hands put him in a subordinate position, unfavourable to his independence and incompatible with the leisure appropriate to the life of a free man. In short it was illiberal. Use was more gentlemanly than manufacture and consumption than production. Industrial and commercial life involved sordid occupations, detrimental not only to health but to character. It was clearly in the interest of the ruling class in a slave-owning community to foster contempt of manual labour. To do otherwise might elevate the status and power of at any rate the most competent and successful slaves and eventually restrict or even destroy the leisure which slavery made possible.

In Plato's *Laws* the classes concerned with industrial and commercial activities lose the name of citizens and exist for the sake of the ruling class, and it was difficult to draw a hard and fast line between strictly manual and therefore illiberal occupations and those suitable for a free man. In the *Laws* even agriculture was forbidden to the citizen, and Aristotle does not permit him to become an artisan or a shopkeeper because those lives are "ignoble and unfavourable to virtue". He also excludes the farmer from the citizen body, on the ground that he would be too busy to engage in politics. That reason recalls a verse from *Ecclesiasticus*, the book of the son of Sirach, written about two centuries after Aristotle: "How can he get wisdom that holdeth the plough, and that glorieth in the goad, that driveth oxen and is occupied in these labours, and whose talk is of bullocks." Aristotle, however, was apparently prepared to grant citizenship to physicians; it will be remembered that his father was a physician.

Aristotle was an even more forthright defender of slavery than Plato. "A slave knows no leisure" was an old Greek saying, and Aristotle's argument seems to be that because a slave had no leisure, he had no opportunity to cultivate his mind and was therefore devoid of the faculty of reason and no better than an animal and beast of burden. A more vicious circle cannot be imagined. First you forcibly deprive a man of his leisure, and then deny him the ability to reason because he has no time to learn how to reason. Artisans, craftsmen, architects, engineers were also discredited, presumably because by spending their time on those occupations they forfeited the leisure otherwise available for academic and liberal pursuits. Here again we are reminded of *Ecclesiasticus*, "The wisdom of a learned man cometh by opportunity of leisure, and he that hath little business shall become wise."

Aristotle was also under the erroneous impression that material progress had come to an end, that there was no more need for practical science or technology, and that pure science and philosophy remained the only subjects worthy of cultivation.

Professor Farrington in his admirable book on Greek science, to which much of this address is indebted, says that contempt for the illiberal arts came in the end to be a serious obstacle to the development of the physical, chemical and mechanical sciences in Greece, for, as he points out, "all the implements and processes by which nature is made to obey man's will had become, if not in fact, yet in the political philosophy of Plato and Aristotle, the province of the slave".

According to Plutarch, Archimedes, about a hundred years later, regarded mechanics in general and everything practical as a low and obscure art. What an extraordinary thing to hear of the greatest engineer in antiquity and what a remarkable tribute to the influence of Plato and Aristotle! This indeed is realized by Plutarch, for he says that since Plato's time "handicraft or the art of engineers, came to be separated from geometry and being long despised by the philosophers it came to be one of the warlike arts."

The notion that any useful invention was vulgar reminds me of the story of a celebrated mathematician of our day, who, after making a startling demonstration of a new formula, said to his students, "The best of it all, gentlemen, is that this wonderful discovery cannot in any possible circumstances be of the slightest use to mankind."

The mechanical arts were not the only ones despised; for we learn from Plutarch again, in his life of Pericles, that "There was never any young gentleman nobly born that, seeing the image of Jupiter which is in the city of Pisa (near Olympia) desired to become Pheidias, or Polyclitus, for seeing of Juno, in the city of Argos." And not many years after Plutarch, Lucian makes Paideia—education—say much the same sort of thing: "Even if you should become a Pheidias or a Polyclitus and make many marvellous works, everyone would praise your craftsmanship but none of those who saw you, if he were sensible, would pray to be like you, for no matter what you might be, you would be considered a 'sordid craftsman, living by manual labour' "—and Paideia goes on to say, "Socrates himself was brought up under the tutelage of our friend Sculpture, but as soon as he understood what was better, he ran away from her and joined my colours."

I doubt whether Lucian himself took this view; he was probably satirizing the educational and social values current in his day, inherited from the doctrines of Plato and Aristotle, a truly "damnosa hereditas". We can contrast Hippocrates some six centuries earlier, who was proud to call himself a craftsman or a technician. The idea that he was thereby depriving himself of

citizenship and the status of a free man would have horrified him.

Needless to say, the Platonic and Aristotelian doctrines, despite the scholars of Alexandria, or inventors like Hero of that city, led to a paralysis of technical progress, for, as long as cheap manpower was available, there was little incentive to devise labour-saving machinery. The effect upon the social life of those days was serious. Many of the poorer citizens in Athens and subsequently in Rome must have counted upon immunity from manual employment, and an idle proletariat emerged to cherish the expectation of support from slave labour. "Panem et circenses" became the equivalent of a welfare state, until finally the drying up of the supply of slaves helped to bring about the internal collapse of Roman economy and the decline and fall of the Roman Empire in western Europe.

The discredit of technology and technicians resulting from the urge of the leisured class to protect its leisure has endured throughout history from the days of Plato and Aristotle. It is true that during the middle ages and later the Church gravely handicapped the work of scientists, like Copernicus and Galileo, but the Church itself was much influenced by Aristotle, through Thomas Aquinas.

Some 2000 years after the *Republic* was written, we find even Bacon in his essay on the "True Greatness of Kingdoms" saying of what he called "the sedentary, within doors and delicate manufactures" that "it was great advantage in the ancient states of Sparta, Athens and Rome and others that they had the use of slaves, which commonly did rid those manufactures", and he recommends that because those arts "have in their nature a contrariety to a military disposition," they should be left to strangers. We get an echo of that sentiment from the statement of a witness before a select committee of the House of Commons in 1879 on the expenditure of the London Schools Board: "The whole effect," he said, "of extra subjects (i.e. other than the three Rs) is to diminish the fierce virtue of an ancient people." And agriculture has not been immune, as can be inferred from the townsman's definition of a farmer given by Jorrocks: "A sort of agricultural convict, condemned to wander in hob-nailed boots through acres of dirt and dandelions." Neither has art escaped, for the late Sir William Rothenstein complained of a "tendency throughout the country to believe that the educated man is the man who appreciates a thing, and the less-educated man the man who does it". It is really alarming to observe the persistence of unscientific ideas when conceived by men of genius like Plato and Aristotle, particularly when, like Plato, they have an unrivalled mastery of expression.

One victim of the Platonic school has been our own educational system. If the Ionian scientists and the teaching of the Hippocratic school had won the day, the divisions and disparities between grammar schools, secondary modern and technical schools, and the dilemma of the eleven plus examination might never have emerged. It looks as if China had been encountering similar problems, for I have just read in the report of a visit to that country by a distinguished English scholar that the Chinese Government is making an effort to include manual labour in the curricula of all departments of the University of Pekin. That is, I think a little too drastic for our universities, though Ruskin tried to teach undergraduates of Balliol how to make roads.

Osler was a great admirer and student of Plato. He was steeped in his dialogues and in one of his addresses says that "If it be true that a man is born a Platonist or an Aristotelian, my congenital bias was toward the Great Idealist", and he goes on to tell us that the cares of this world had driven him into the camp of the Stagirite, Aristotle, regarded for 23 centuries as "the master of those that know". I think, however, that his tribute to those two men was paid to their metaphysical and scientific expositions and not to their political and social theses; in fact, I rather doubt that in discussing the relations between science and humanism their regrettable opinions had occurred to him. Nevertheless in writing of Aristotle that "no man has ever swayed such an intellectual empire in logic, metaphysics, rhetoric, psychology, ethics, poetry, politics and natural history—in all a creator and in all still a master", Osler was indisputably correct. So in venturing to make any criticism of Aristotle, I can only rely on a precedent furnished by George III who remarked that "some of Shakespeare was sad stuff, but one must not say so", and as regards Plato, I get a shade of support from Bertrand Russell's statement in his "*Unpopular Essays*": "That Plato's *Republic* should have been admired on its political side by decent people is perhaps the most outstanding example of literary snobbery in history."

I hope, however, that I have not given the impression that I decry philosophers and philosophy. In view of my experience in Literae Humaniores that is the last thing I should wish to do, and I cordially agree with Galen's dictum, "the best physician is also a philosopher," if, as I think, he meant by philosophy, love of wisdom in the broadest sense and not excluding love of science, pure or applied. We should remember that "sophia" meant skill in craftsmanship as well as wisdom, and Galen may well have had in mind the aphorism of Hippocrates, "The philosopher physician is equal to the gods."

But whether or not Osler had studied the origin of the gulf between the old and new sciences and the humanities, he was well aware of its existence, and no man was better qualified than he to promote the bridging of it. It is largely owing to his teaching that scientists and humanists are beginning to cross over into each other's territories, though in numbers too small at present to justify the fears of some observers of this two-way traffic that the country of the scientist will become overcrowded. It may of course be true that there will not always be room in it for the humanist as a permanent resident, nor is it desirable that there should be, but everything ought to be done to encourage him as a guest and visitor.

In an address given at the Bodleian in 1916, Osler pointed out that in the days of Sir Thomas Bodley there lived the last of the great transmitters, Robert Burton, the first of the great transmuters, Francis Bacon, and the greatest of the world's creators, William Shakespeare. Osler cannot, I think, be ranked as a creator, though in narrowing by precept and example the gap between the scientist and the humanist he was not far from a transmuter. He was however beyond doubt one of the greatest transmitters of

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modern times, for he was one of the greatest teachers, and a great teacher is *ex hypothesi* a great transmitter. And Osler was a philosopher (a lover of wisdom) to the core by virtue of his character, his industry and his intelligence.

Xenophon has said—and very truly—that nobody ever received any education from a man he did not care for. Osler's kindliness and good humour won the affection of all who were fortunate enough to be his pupils. Everyone of them "cared" for him, for not only was he a lover of wisdom but a lover of man, and in the words of Hippocrates, "Where the love of mankind is, there also is the love of science."

To a young man studying science and medicine, Osler's love of man—his humanity—must have been a veritable inspiration. And coupled with it was his insight of human nature, evidenced by the equanimity which he counselled—imperturbability, coolness and presence of mind in all circumstances. Sir Osbert Sitwell has told us in one of his delightful books that "the sceptically inclined eighteenth century invalid altogether lacked that element, potent, mysterious, almost mystic, which can assume so important a place in the relationship between patient and medical adviser, and which in one of its forms has been described as 'confidence in the doctor'." In contrast, no nineteenth or twentieth century invalid could have got the slightest impression of fear or anxiety—however well justified by his condition—from Osler or from any physician or surgeon who followed his precepts.

As he said in his book entitled "*Æquanimitas*", "An inscrutable face may prove a fortune." In the words of Galen: "He cures most in whom most are confident." Osler's presence at the bedside—and that was where he preferred to be—must have been worth every drug in the pharmacopœia.

A short while ago, while preparing this address, I read Harvey Cushing's *Life of Osler* and have seldom read two more fascinating or instructive volumes. On putting them down I was filled with regret that I had not read them many years ago for I should have profited exceedingly by that story of a great teacher, and I can imagine the beneficent effect they would have on a young man who read them today, be he scientist or humanist. Osler was one of the most cultured men of his generation, indeed of any generation. He set himself in Matthew Arnold's words, "to learn and propagate the best that is known and thought in the world" and became familiar with an immense range of literature, ancient, mediæval and modern. His industry was little short of miraculous; a mere index of the authors to whom he refers and his quotations from their works would fill a volume. Although a rapid reader, he was no cursory skimmer of what he read. When he put a book down he could have said with truth not only "legi" but "perlegi", and to the reading of books he added a profound knowledge of the history of their publication. He was a bibliographer as well as a bibliophile. He was also a shrewd and passionate collector of books, in short a bibliomaniac.

How was it all done? One would expect his professional studies, his clinical work, teaching, lecturing, addressing learned societies to have filled every waking moment of an exceptionally busy life: and besides being an omnivorous reader, he was a voluminous correspondent. Assuredly he lived laborious days, though he did not scorn delights, for he found time for much social engagement.

What was the secret of this extraordinary achievement? Harvey Cushing attributed it to his life-long habit of reading in bed for half an hour before putting out the light. No doubt that helped, but I think Osler himself gave the answer in his address to the teachers and students of the University of Minnesota in 1892. "Ask any active business man," he said, "or any leader of a profession the secret which enabled him to accomplish his work, and he will reply in one word, system, or as I shall term it, the virtue of method, the harness without which only the horses of genius travel." Part of his method was to read, pencil in hand. He was, in his own words, a note-book man. He had formed the habit of jotting down the gist of what he read, so that it could be drawn upon when needed, and he had an exceptionally retentive memory.

Apart from Osler, we know of few men who have achieved distinction in the twin spheres of science and the humanities and they have mostly been physicians, men like Linacre, Sir Thomas Browne and Oliver Wendell Holmes. And here I confess that until I had occasion to acquaint myself with Osler's career, I had never read *Religio Medici* and I am full of gratitude to Osler for introducing me to that work of his hero, Sir Thomas Browne, and not only to *Religio Medici* but to *Hydrotaphia*—Urne Burial—one of the most beautiful and moving essays in the English language. I would add to the great names I have mentioned that of the late Professor Sir D'Arcy Thompson, the famous zoologist—who was president of the Classical Association some ten years after Osler. His address "Science and the classics" was in my judgment one of the finest presidential addresses ever delivered. It is true that he declared that it had been the rule from time immemorial, and not the exception, for science and the humanities to go hand in hand; he cited as examples Aristotle the naturalist, who wrote of poetry, Plato, the lover of astronomy—as a matter of fact, Plato set astronomical science back by over a thousand years—and Theophrastus the botanist and master of rhetoric. But the rest of his examples were physicians, and it seems that it is the physicians, with Osler as the last and most influential amongst them, who have done most to bridge the chasm between science and the humanities. And I must not omit the name of the late Sir Charles Sherrington, one of our greatest physiologists and, as is evident from his masterpiece "*Man, on his nature*", a man of exceptionally wide culture and scholarship.

I read a short while ago an article published a few years back entitled "Medicine and the humanities" by Professor Cawadias. In it he stated that most of the great physicians of the ages have been great classical scholars, even if they had read Greek in translation. Sir Thomas Browne, Holmes, Osler, Thompson and Sherrington were not great classical scholars, but each of them had had a classical education in his youth, and had acquired some familiarity with and much love for the Latin and Greek languages and the thoughts of those peoples. To that, I think, combined in the case of Osler and probably of the others with an intimate knowledge of the Bible and of Shakespeare, is due their command of the English language, for a

majority of the words we use have a Latin or Greek origin.

I should like, if there were space enough, to quote many of the fine passages and thoughts which abound in Osler's writings, but I must content myself with one. It is a description of a service in Lincoln Cathedral and Osler found himself wondering whence came the inspiration of the craftsmen who built it. "Absorbed in thought I did not hear the beginning of the music, and then as a response to my reverie and rousing me from it, rang out the clear voice of the boy leading the antiphon 'That thy power, thy glory and the mightiness of thy Kingdom might be known unto us.' Here was the answer to my question, 'by what spirit were the craftsmen moved?'" And there is another passage which I should like to quote—but it is too long—the dreadful story of the death of Michael Servetus at the stake. The word-painting of this horrible tragedy has few if any equals in literature.

To sum up, it is not unusual to hear humanists upbraid scientists for their inability to express themselves in good English. If that reproach is justified, and sometimes it may be, those who follow the example and precepts of Osler will escape it. Professor Cawadias in the article I have quoted says that "The shock of two world catastrophic wars and the even greater shock of our post-war atomic age have stimulated medical thinking, and humanistic culture comes once more into the foreground—William Osler played a great role in this medical humanistic renaissance." He was, as Sir Frederick Kenyon said, "a well nigh perfect example of the union of science with the humanities". But we also need a humanistic scientific renaissance. Neither at school nor at the University of Oxford did anyone make the slightest effort to teach me even the rudiments of science—I was scientifically illiterate and still am, and my experience is certainly not unique. Whether the teaching of humanists at the university has altered much since my day, I do not know. From the examination papers I have mentioned it does not seem that it has. But it is really almost a crime to send young men out into this modern world ignorant of the principles of science. It should be possible to include in a humanist's education "enough of the processes of science to enable him to grasp its possibilities and understand what it means to the life of mankind".

Much of Osler's teaching was directed to convincing the medical profession of the need for culture. Can that or any other profession find another Osler, not to stimulate scientists to interest themselves in the humanities, but humanists in science? For if they do not take that interest, there may well be weight in the warning given by Professor C. S. Lewis, "The intelligentsia (scientists apart) are losing all touch with and all influence over nearly the whole human race." As Sir Charles Snow has observed, the intellectual life of the whole of western society is increasingly being split into two polar groups: literary intellectuals at one pole and at the other, scientists, with a gulf of mutual incomprehension between the two. But thanks to Sir William Osler and his teaching, I believe that there is now a growing awareness of the need for closer contact and sympathy between these groups, and we can pay no greater tribute to the memory of Sir William Osler than by encouraging their co-operation.

CANADIAN HOSPITALS APPROVED FOR ADVANCED GRADUATE TRAINING

by

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

as at March 31, 1960

(previous lists are superseded by this list)

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SPECIALTY OF ANÆSTHESIA

Calgary General Hospital—3	Calgary, Alberta
Edmonton General Hospital—3	Edmonton, "
Royal Alexandra Hospital—4(j)	" "
University of Alberta Hospital—8	" "
Royal Columbian Hospital—3	New Westminster, B.C.
Grace Hospital—2(b)	Vancouver, B.C.
St. Paul's Hospital—3	" "
St. Vincent's Hospital—2(b)	" "
Shaughnessy Hospital (D.V.A.)—4(h) and 6	" "
Vancouver General Hospital—8	" "
St. Boniface Hospital—8	St. Boniface, Man.
Children's Hospital—3(o)	Winnipeg, "
Deer Lodge Hospital (D.V.A.)—5 and 6	" "
Winnipeg General Hospital—8	" "
Salvation Army Grace Hospital—2(c)	" "
Moncton Hospital—3	Moncton, N.B.
Saint John General Hospital—3(j)	Saint John, "
St. John's General Hospital—3	St. John's, Nfld.
Camp Hill Hospital (D.V.A.)—3 and 6	Halifax, Nova Scotia
The Children's Hospital—1	" " "
Victoria General Hospital—8	" " "
Hamilton General Hospitals—4	Hamilton, Ontario
St. Joseph's Hospital—3	" "
Hôtel-Dieu Hospital—3	Kingston, "
Kingston General Hospital—8	" "
St. Joseph's Hospital—3(k)	London, "
Victoria Hospital—8	" "
Westminster Hospital (D.V.A.) 5 and 6	" "
Ottawa Civic Hospital—3	Ottawa, "
Hospital for Sick Children—3	Toronto, "
New Mount Sinai Hospital—3(a)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—4	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "

For Numerical References, see pages 747 and 748.

Women's College Hospital—3(d)	Toronto, Ontario
Toronto Hospital for Tuberculosis—3	Weston, "
Hôtel-Dieu Saint-Vallier—3	Chicoutimi, Quebec
Hôpital du Sacré-Cœur—4	Montreal, "
Hôpital Maisonneuve—4	" "
Hôpital Notre-Dame—8	" "
Hôpital Saint-Luc—2(b)	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Montreal Children's Hospital—3	" "
Montreal General Hospital—8	" "
Montreal Neurological Institute—3	" "
Queen Elizabeth Hospital—3	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Reddy Memorial Hospital—3	" "
Royal Victoria Hospital—8	" "
St. Mary's Hospital—3	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
L'Hôpital Laval—3	" "
Hôpital du Saint-Sacrement—8	" "
Hôpital St-François-d'Assise—3	" "
L'Hôtel-Dieu de Québec—8	" "
Hôpital Général St-Vincent-de-Paul—3(a)	Sherbrooke, "
Hôpital Général de Verdun—3(a)	Verdun, "
Hôpital Notre-Dame-de-l'Espérance—3(g)	Ville St-Laurent, Quebec
Regina General Hospital—3	Regina, Sask.
University Hospital—8	Saskatoon, Sask.

SPECIALTY OF BACTERIOLOGY

University of Alberta Hospital—8	Edmonton, Alberta
Vancouver General Hospital—8	Vancouver, B.C.
Winnipeg General Hospital—4(g)	Winnipeg, Manitoba
St. John's General Hospital—3(c)	St. John's, Nfld.
Victoria General Hospital—8	Halifax, Nova Scotia
Mountain Sanatorium—2	Hamilton, Ontario
Kingston General Hospital—8	Kingston, "
Hospital for Sick Children—3(g)	Toronto, "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Women's College Hospital—3	" "
Toronto Hospital for Tuberculosis—2	Weston, "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Victoria Hospital—8	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
University Hospital—4(l)	Saskatoon, Sask.

SPECIALTY OF DERMATOLOGY

Hospital for Sick Children—2(d)	Toronto, Ontario
Sunnybrook Hospital (D.V.A.)—3 and 6	" "
Toronto General Hospital—8	" "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôtel-Dieu de Montréal—8	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—3 and 6	" "
Royal Victoria Hospital—8	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
L'Hôtel-Dieu de Québec—8	" "

SPECIALTY OF INTERNAL MEDICINE

Baker Memorial Sanatorium—3(g)	Calgary, Alberta
Colonel Belcher Hospital (D.V.A.)—3 and 6	" "
Aberhart Memorial Sanatorium—3(g)	Edmonton, Alta.
Charles Camsell Indian Hospital—3(g)	" "
Edmonton General Hospital—3	" "
Misericordia Hospital—3(a)	" "
Royal Alexandra Hospital—3	" "
University of Alberta Hospital—8	" "
St. Paul's Hospital—3(d)	Vancouver, B.C.
Shaughnessy Hospital (D.V.A.)—5 and 6	" "
Vancouver General Hospital—8	" "
Willow Chest Centre—3(g)	" "
Victoria Veterans' Hospital (D.V.A.)—3(g) and 6	Victoria, "
Manitoba Sanatorium—3(g)	Ninette, Manitoba
St. Boniface Hospital—4	St. Boniface, "
St. Boniface Sanatorium—3(g)	St. Vital, "
Deer Lodge Hospital (D.V.A.)—5 and 6	Winnipeg, "
Winnipeg General Hospital—8	" "
Lancaster Hospital (D.V.A.)—3 and 6	Saint John, N.B.
Saint John General Hospital—3(j)	" " "
St. John's General Hospital—3(d)	St. John's, Nfld.
Camp Hill Hospital (D.V.A.)—5 and 6	Halifax, Nova Scotia
Halifax Tuberculosis Hospital—3(g)	" " "
Victoria General Hospital—8	" " "
Nova Scotia Sanatorium—3(g)	Kentville, " "
Point Edward Hospital—2(e)	Sydney, " "
Hamilton General Hospitals—4(n)	Hamilton, Ontario
Mountain Sanatorium—3(g)	" "
Canadian Forces Hospital—3(c)	Kingston, "
Hôtel-Dieu Hospital—3(a)	" "
Kingston General Hospital—8	" "
Beck Memorial Sanatorium—3(g)	London, "
St. Joseph's Hospital—3	" "
Victoria Hospital—8	" "
Westminster Hospital (D.V.A.)—5 and 6	" "
Ottawa Civic Hospital—4	Ottawa, "
Ottawa General Hospital—4(b)	" "
New Mount Sinai Hospital—3(f)	Toronto, "
Princess Margaret Hospital—3(g) (Ontario Cancer Institute)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Military Hospital—3(g)	" "
Toronto Western Hospital—8	" "
Women's College Hospital—3(d)	" "
Toronto Hospital for Tuberculosis—3(g)	Weston, "
Hôtel-Dieu St-Vallier—4	Chicoutimi, Quebec
Hôpital du Sacré-Cœur—3(g)	Montreal, "
Hôpital Maisonneuve—5(b)	" "
Hôpital Notre-Dame—8	" "
Hôpital Saint-Luc—4	" "
Hôtel-Dieu de Montréal—8	" "
Institut de Cardiologie de Montréal—3(g)	" "
Jewish General Hospital—5(c)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Reddy Memorial Hospital—3(o)	" "
Royal Edward Laurentian Hospital—3(g) (Montreal and Laurentian Divisions)	Montreal and Ste-Agathe-des-Monts, Quebec
Royal Victoria Hospital—8	Montreal, Quebec
St. Mary's Hospital—4(n)	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
L'Hôpital Laval—3(g)	" "
Hôpital St-François d'Assise—3	" "
Hôpital Ste-Foy (D.V.A.)—5 and 6	" "
L'Hôtel-Dieu de Québec—8	" "
Ste-Anne's Hospital (D.V.A.)—5 and 6	Ste-Anne-de-Bellevue, Quebec

For Numerical References, see pages 747 and 748.

Hôpital Général St-Vincent-de-Paul —3(c)	Sherbrooke, Quebec
Hôpital Général de Verdun—4(b)	Verdun "
Regina General Hospital—3(i)	Regina, Sask.
St. Paul's Hospital—3(o)	Saskatoon, "
Saskatoon City Hospital—3(o)	" "
University Hospital—8	" "

SPECIALTY OF NEUROLOGY

University Hospital—4	Edmonton, Alberta
Vancouver General Hospital—3(a)	Vancouver, B.C.
Hospital for Sick Children—3(g)	Toronto, Ontario
Sunnybrook Hospital (D.V.A.)— 5 and 6	" "
Toronto General Hospital—8	" "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Montreal Neurological Institute—8	" "
Queen Mary Veterans' Hospital (D.V.A)—3 and 6	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
University Hospital—4(a)	Saskatoon, Sask.

SPECIALTY OF NEUROSURGERY

University of Alberta Hospital—8	Edmonton, Alberta
Deer Lodge Hospital (D.V.A.)— 5 and 6	Winnipeg, Manitoba
Winnipeg General Hospital—3(a)	" "
Victoria General Hospital—8(a)	Halifax, Nova Scotia
Victoria Hospital—3(a)	London, Ontario
Hospital for Sick Children—3	Toronto, Ontario
St. Michael's Hospital—3(a)	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—3(a)	" "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôtel-Dieu de Montréal—3(a)	" "
Montreal Neurological Institute—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
University Hospital—4(m)	Saskatoon, Sask.

SPECIALTY OF OBSTETRICS AND GYNÆCOLOGY

Royal Alexandra Hospital—4(b)	Edmonton, Alberta
University of Alberta Hospital—8	" "
Grace Hospital—2(b)	Vancouver, B.C.
St. Paul's Hospital—3(d)	" "
Vancouver General Hospital—8	" "
St. Boniface Hospital—3(a)	St. Boniface, Man.
Winnipeg General Hospital—8	Winnipeg "
Saint John General Hospital—3(j)	Saint John, N.B.
St. Joseph's Hospital—3	Hamilton, Ontario
Hamilton General Hospitals—3	" "
Hôtel-Dieu Hospital—3(a)	Kingston, "
Kingston General Hospital—8	" "
St. Joseph's Hospital—3	London, "
Victoria Hospital—8	" "
Ottawa Civic Hospital—3	Ottawa, "
Ottawa General Hospital—4(a)	" "
Grace Hospital—3	Toronto, "
New Mount Sinai Hospital—3(d)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Salvation Army Grace Hospital—3(k)	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "
Women's College Hospital—4(o)	" "
Hôpital Notre-Dame—8	Montreal, Quebec
Jewish General Hospital—4(g)	" "
Queen Elizabeth Hospital—2(c)	" "
Reddy Memorial Hospital—3(k)	" "
Royal Victoria Hospital—8	" "
St. Mary's Hospital—4(n)	" "
Hôpital de l'Enfant-Jésus—3	Quebec, "
Hôpital du Saint-Sacrement—8	" "

For Numerical References, see pages 747 and 748.

Regina General Hospital—3(i)	Regina, Sask.
University Hospital—8	Saskatoon, Sask.

SPECIALTY OF OBSTETRICS

Salvation Army Grace Hospital—3(d)	Winnipeg, Manitoba
Grace Maternity Hospital—8	Halifax, Nova Scotia
Hôtel-Dieu Saint-Vallier—3(a)	Chicoutimi, Quebec
Catherine Booth Mother's Hospital —2(c)	Montreal, "
Hôpital Maisonneuve—4(a)	" "
Hôpital Sainte-Justine—4(n)	" "
Montreal General Hospital—3	" "
Hôpital de la Miséricorde—3(d)	Quebec, Quebec
Hôpital St-François-d'Assise—3	" "

SPECIALTY OF GYNÆCOLOGY

Victoria General Hospital—8	Halifax, Nova Scotia
Hôpital Maisonneuve—4(a)	Montreal, Quebec
Hôtel-Dieu de Montréal—8	" "
Montreal General Hospital—8	" "
L'Hôtel-Dieu de Québec—8	Quebec, "

SPECIALTY OF OPHTHALMOLOGY

University of Alberta Hospital—8	Edmonton, Alberta
Shaughnessy Hospital (D.V.A.)— 3(g) and 6	Vancouver, B.C.
Vancouver General Hospital—8	" "
Winnipeg General Hospital—3(a)	Winnipeg, Manitoba
Saint John General Hospital—3(j)	Saint John, N.B.
Kingston General Hospital—7(h)	Kingston, Ontario
Victoria Hospital—4(l)	London, "
Ottawa Civic Hospital—7(h)	Ottawa, "
Ottawa General Hospital—7(h)	" "
Hospital for Sick Children—2(b)	Toronto, "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)— 4 and 6	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "
Hôpital Maisonneuve—4(a)	Montreal, Quebec
Hôpital Notre-Dame—8	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Montreal Children's Hospital—2	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—4 and 6	" "
Royal Victoria Hospital—8	" "
Hôpital St-François-d'Assise—3	Quebec, "
Hôpital du Saint-Sacrement—8	" "
L'Hôtel-Dieu de Québec—8	" "
University Hospital—5	Saskatoon, Sask.

SPECIALTY OF ORTHOPÆDIC SURGERY

Royal Alexandra Hospital—3(a)	Edmonton, Alberta
University of Alberta Hospital—8	" "
Children's Hospital—2	Vancouver, B.C.
Shaughnessy Hospital (D.V.A.)— 5 and 6	" "
St. Paul's Hospital—3(o)	" "
Vancouver General Hospital—8	" "
St. Boniface Hospital—3(k)	St. Boniface, Man.
Children's Hospital—2	Winnipeg, "
Deer Lodge Hospital (D.V.A.)— 5 and 6	" "
Shriners' Hospital for Crippled Children (Winnipeg Unit)—2(b)	" "
Winnipeg General Hospital—5	" "
Victoria Hospital—3	London, Ontario
Ottawa General Hospital—3(a)	Ottawa, "
Hospital for Sick Children—3	Toronto, "
St. Joseph's Hospital—3(k)	" "
St. Michael's Hospital—3(a)	" "
Sunnybrook Hospital (D.V.A.)— 5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—3(a)	" "
Toronto Hospital for Tuberculosis—2	Weston, "

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Hôtel-Dieu St-Vallier—4	Chicoutimi, Quebec
Hôpital Maisonneuve—3(a)	Montreal, Quebec
Hôpital Notre-Dame—3	" "
Hôpital du Sacré-Cœur—8	" "
Hôpital Saint-Luc—4	" "
Hôpital Sainte-Justine—3	" "
Hôtel-Dieu de Montréal—3(a)	" "
Montreal Children's Hospital—3	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Victoria Hospital—8	" "
Shriners' Hospital for Crippled Children—3(d)	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
L'Hôtel-Dieu de Québec—3	" "
Hôpital Général de Verdun—4(a)	Verdun, "
University Hospital—8	Saskatoon, Sask.

SPECIALTY OF OTOLARYNGOLOGY

University of Alberta Hospital—8	Edmonton, Alberta
Shaughnessy Hospital (D.V.A.)—3(g) and 6	Vancouver, B.C.
Vancouver General Hospital—8	" "
Saint John General Hospital—3(j)	Saint John, N.B.
Hospital for Sick Children—2(d)	Toronto, Ontario
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—4 and 6	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "
Hôtel-Dieu Saint-Vallier—3(g)	Chicoutimi, Quebec
Hôpital Notre-Dame—8	Montreal, Quebec
Hôpital Saint-Luc—3	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Montreal Children's Hospital—2(d)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—4 and 6	" "
Royal Victoria Hospital—8	" "
Hôpital St-François-d'Assise—3	Quebec, "
Hôpital du Saint-Sacrement—8	" "
L'Hôtel-Dieu de Québec—8	" "

SPECIALTY OF PÆDIATRICS

Royal Alexandra Hospital—3	Edmonton, Alberta
University of Alberta Hospital—4	" "
Children's Hospital—2	Vancouver, B.C.
St. Paul's Hospital—3	" "
Vancouver General Hospital—8	" "
St. Boniface Hospital—3(d)	St. Boniface, Man.
Children's Hospital—8	Winnipeg, "
Winnipeg General Hospital—2(d)	" "
Saint John General Hospital—3	Saint John, N.B.
St. John's General Hospital—3(a)	St. John's, Nfld.
Children's Hospital—4	Halifax, Nova Scotia
Hamilton General Hospitals—3	Hamilton, Ontario
Kingston General Hospital—3	Kingston, "
Victoria Hospital—4	London, "
Ottawa Civic Hospital—3	Ottawa, "
Ottawa General Hospital—4(b)	" "
Hospital for Sick Children—8	Toronto, "
New Mount Sinai Hospital—3(c)	" "
St. Joseph's Hospital—3	" "
Hôpital Maisonneuve—3(a)	Montreal, Quebec
Hôpital Notre-Dame—8	" "
Hôpital Pasteur—2	" "
Hôpital Sainte-Justine—8	" "
Jewish General Hospital—2(a)	" "
Montreal Children's Hospital—8	" "
Royal Victoria Hospital—8	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
L'Hôtel-Dieu de Québec—8	" "
Hôpital Général de Verdun—4(a)	Verdun, "
Regina General Hospital—3(i)	Regina, Sask.
University Hospital—4(g)	Saskatoon, Sask.

For Numerical References, see pages 747 and 748.

SPECIALTY OF PATHOLOGY

Calgary General Hospital—3(a)	Calgary, Alberta
Holy Cross Hospital—3(d)	" "
Provincial Laboratory of Public Health (Southern Branch)—3(k)	" "
Edmonton General Hospital—4	Edmonton, Alberta
Misericordia Hospital—4(p)	" "
Royal Alexandra Hospital—4	" "
University of Alberta Hospital—8	" "
St. Michael's General Hospital—3	Lethbridge, "
Royal Columbian Hospital—3(d)	New Westminster, B.C.
Shaughnessy Hospital (D.V.A.)—5 and 6	Vancouver, B.C.
St. Paul's Hospital—4(p)	" "
Vancouver General Hospital—8	" "
Royal Jubilee Hospital—3(a)	Victoria, "
St. Boniface Hospital—4	St. Boniface, Man.
Children's Hospital—3(g)	Winnipeg, "
Deer Lodge Hospital (D.V.A.)—5 and 6	" "
Salvation Army Grace Hospital—3(n)	" "
Winnipeg General Hospital—8	" "
Moncton Hospital—3(r)	Moncton, N.B.
Lancaster Hospital (D.V.A.)—2 and 6	Saint John, "
Saint John General Hospital—4(a)	" " "
St. John's General Hospital—3	St. John's, Nfld.
Camp Hill Hospital (D.V.A.)—3(l) and 6	Halifax, Nova Scotia
Victoria General Hospital—8	" " "
Regional Laboratory—3(g)	Fort William, Ont.
Hamilton General Hospitals—4	Hamilton, Ontario
Mountain Sanatorium—2	" "
St. Joseph's Hospital—3	" "
Hôtel-Dieu Hospital—3	Kingston, "
Kingston General Hospital—8	" "
Regional Laboratory—3(g)	London, "
Victoria Hospital—8	" "
Westminster Hospital (D.V.A.)—3 and 6	" "
Ottawa Civic Hospital—8	Ottawa, "
Ottawa General Hospital—8	" "
Central Laboratory—3(g)	Toronto, "
Hospital for Sick Children—3(g)	" "
New Mount Sinai Hospital—3(d)	" "
Princess Margaret Hospital—4(p) (Ontario Cancer Institute)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "
Women's College Hospital—3(m)	" "
Toronto Hospital for Tuberculosis—2	Weston, "
Metropolitan General Hospital—4(p)	Windsor, "
Hôtel-Dieu Saint-Vallier—3(k)	Chicoutimi, Quebec
Hôpital du Sacré-Cœur—3(n)	Montreal, "
Hôpital Maisonneuve—5	" "
Hôpital Notre-Dame—8	" "
Hôpital Saint-Luc—4	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Jewish General Hospital—5(d)	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Queen Elizabeth Hospital—3(a)	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Reddy Memorial Hospital—3	" "
Royal Victoria Hospital—8	" "
St. Mary's Hospital—3(f)	" "
L'Hôpital Laval—3(l)	Quebec, "
Hôpital St-François-d'Assise—3	" "
Hôpital de l'Enfant-Jésus—4(r)	" "
Hôpital du Saint-Sacrement—8	" "
L'Hôtel-Dieu de Québec—8	" "
Hôpital Général St-Vincent-de-Paul—3	Sherbrooke, "
Hôpital Général de Verdun—3	Verdun, "
Regina General Hospital—3(i)	Regina, Sask.
Regina Grey Nuns' Hospital—3	" "

Saskatoon City Hospital—4	Saskatoon, Sask.
St. Paul's Hospital—4(q)	" "
University Hospital—8	" "

SPECIALTY OF PHYSICAL MEDICINE AND REHABILITATION

University of Alberta Hospital—4	Edmonton, Alberta
Workmen's Compensation Board Rehabilitation Clinic—3(a)	" "
G. F. Strong Rehabilitation Centre—3	Vancouver, B.C.
Shaughnessy Hospital (D.V.A.)—3 and 6	" "
Group Approval—five hospitals—7(b)	London, Ontario
Sunnybrook Hospital (D.V.A.)—3 and 6	Toronto, "
Toronto General Hospital—8	" "
Toronto Western Hospital—3(a)	" "
W. C. B. Hospital and Rehabilitation Centre—3(g)	Malton, "
Hôpital Pasteur—7(c)	Montreal, Quebec
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—3 and 6	" "
Rehabilitation Centre—7(c)	" "
La Clinique de Réhabilitation de Québec, Inc.—7(g)	Quebec, "
L'Hôpital Laval—7(g)	" "
University Hospital—8	Saskatoon, Sask.

SPECIALTY OF PLASTIC SURGERY

Hospital for Sick Children—3(d)	Toronto, Ontario
St. Michael's Hospital—3(a)	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—3(a)	" "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—3(a)	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Victoria Hospital—8	" "

SPECIALTY OF PSYCHIATRY

The policy of the College relative to granting approval to hospitals for advanced graduate training in psychiatry has been revised and approval will now be given to hospitals only when their training program is organized under university or similar auspices. The deans of medical schools across Canada are aware of these requirements and have been asked to assist psychiatric hospitals and clinics in reorganizing their training programs.

The four-year period of training in psychiatry is being organized as an integrated whole by those persons responsible for psychiatry in the various provinces. No one hospital or institution will serve the objective, but rather a series of appointments in a variety of hospitals, clinics and other settings will be required.

Enquiries regarding the status of a specific hospital should be directed to the College Office, but in the interim period while training programs are being arranged, the approval to the following hospitals remains unchanged.

Provincial Guidance Clinic—3(k)	Edmonton, Alberta
University of Alberta Hospital—4	" "
Provincial Mental Hospital—3	Ponoka, "
Provincial Mental Hospital—3	Essondale, B.C.
Shaughnessy Hospital (D.V.A.)—5 and 6	Vancouver, "
Vancouver General Hospital—3(a)	" "
Hospital for Mental Diseases—3	Brandon, Manitoba
Hospital for Mental Diseases—3	Selkirk, "
Deer Lodge Hospital (D.V.A.)—5 and 6	Winnipeg, "
Winnipeg Psychopathic Hospital—8	" "
Provincial Hospital—3(k)	Campbellton, N.B.
Provincial Hospital—3	Saint John, "
Hospital for Mental and Nervous Diseases—3	St. John's, Nfld.
Nova Scotia Hospital—3(k)	Dartmouth, N.S.
Camp Hill Hospital (D.V.A.)—3 and 6	Halifax, "
Children's Hospital—3	" "
Victoria General Hospital—3	" "
Hôtel-Dieu Hospital—7(f)	Kingston, Ontario
Kingston General Hospital—7(f)	" "
Ontario Hospital—3	Hamilton, Ontario
Ontario Hospital—3	Kingston, "
Ontario Hospital—3	London, "
St. Joseph's Hospital—3	" "
Victoria Hospital—3	" "
Westminster Hospital (D.V.A.)—5 and 6	" "
Ottawa General Hospital—7(e)	Ottawa, "
Ontario Hospital—3(g)	St. Thomas, "
Hospital for Sick Children—3(g)	Toronto, "
Ontario Hospital, 999 Queen St. W.—3(k)	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto Psychiatric Hospital—8	" "
Hôpital Maisonneuve—3(a)	Montreal, Quebec
Hôpital Notre-Dame—3	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—8	" "
Institut Albert Prévost—3	" "
Jewish General Hospital—3(k)	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Victoria Hospital—8	" "
Hôpital St-Michel-Archange et la Clinique Roy-Rousseau—8	Quebec "
Ste-Anne's Hospital (D.V.A.)—5 and 6	Ste-Anne-de-Bellevue, Quebec
Verdun Protéstant Hospital—3	Verdun, Quebec
Saskatchewan Hospital—3(j)	North Battleford, Sask.
Regina General Hospital—3(g)	Regina, "
University Hospital—8	Saskatoon, "
Saskatchewan Hospital—3(j)	Weyburn, "

SPECIALTY OF DIAGNOSTIC RADIOLOGY

Calgary General Hospital—3	Calgary, Alberta
Royal Alexandra Hospital—4(o)	Edmonton, "
University of Alberta Hospital—8	" "
Shaughnessy Hospital (D.V.A.)5 and 6	Vancouver, B.C.
St. Paul's Hospital—4(e)	" "
Vancouver General Hospital—8	" "
Royal Jubilee Hospital—3(a)	Victoria, "
St. Boniface Hospital—4	St. Boniface, Man.
Deer Lodge Hospital (D.V.A.)—5 and 6	Winnipeg, "
Winnipeg General Hospital—8	" "
Moncton Hospital—3(a)	Moncton, N.B.
Saint John General Hospital—4(d)	Saint John, N.B.
St. John's General Hospital—3(c)	St. John's, Nfld.
Group Approval—four hospitals—7(a)	Halifax, N.S.
Victoria General Hospital—8	" "
Hamilton General Hospitals—3	Hamilton, Ontario
Canadian Forces Hospital—3(k)	Kingston, "
Hôtel-Dieu Hospital—3	" "
Kingston General Hospital—8	" "
St. Joseph's Hospital—4	London, "
Victoria Hospital—8	" "
Westminster Hospital (D.V.A.)—3 and 6	" "
Ottawa Civic Hospital—8	Ottawa, "
Ottawa General Hospital—5(a)	" "
Hospital for Sick Children—3(h)	Toronto, "
New Mount Sinai Hospital—3(c)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "

For Numerical References, see pages 747 and 748.

Hôtel-Dieu St-Vallier—4	Chicoutimi, Quebec
Hôpital Maisonneuve—4	Montreal, "
Hôpital Notre-Dame—8	" "
Hôpital Saint-Luc—4(e)	" "
Hôpital Sainte-Justine—3(g)	" "
Hôpital Ste-Jeanne-d'Arc—3(a)	" "
Hôtel-Dieu de Montréal—8	" "
Institut du Radium—3	" "
Jewish General Hospital—3(a)	" "
Montreal Children's Hospital—3(g)	" "
Montreal General Hospital—8	" "
Montreal Neurological Institute—3	" "
Queen Elizabeth Hospital—4(d)	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Reddy Memorial Hospital—3	" "
Royal Victoria Hospital—8	" "
St. Mary's Hospital—3(d)	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
Hôpital Ste-Foy (D.V.A.)—6 and 7(d)	" "
Hôpital St-François d'Assise—3	" "
L'Hôtel-Dieu de Québec—8	" "
Postgraduate Course in Radiology under auspices of Laval University, ten hospitals—7(d)	" "
Hôpital Général St-Vincent-de-Paul—3	Sherbrooke, "
Hôpital Général de Verdun—3(a)	Verdun, "
Regina General Hospital—4(d)	Regina, Sask.
Regina Grey Nuns' Hospital—4(d)	" "
St. Paul's Hospital—4(e)	Saskatoon, Sask.
Saskatoon City Hospital—3	" "
University Hospital—8	" "

SPECIALTY OF THERAPEUTIC RADIOLOGY

University of Alberta Hospital—3	Edmonton, Alberta
British Columbia Cancer Institute—8	Vancouver, B.C.
St. Paul's Hospital—4(e)	" "
Royal Jubilee Hospital—4(d)	Victoria, B.C.
St. Boniface Hospital—4	St. Boniface, Man.
Winnipeg General Hospital—8	Winnipeg, Man.
Saint John General Hospital—3(j)	Saint John, N.B.
Victoria General Hospital—8	Halifax, Nova Scotia
Hamilton General Hospitals—3	Hamilton, Ontario
Kingston General Hospital—8	Kingston, Ontario
Victoria Hospital—8	London, Ontario
Ottawa Civic Hospital (Ottawa Clinic, Ontario Cancer Foundation)—8	Ottawa, "
Ottawa General Hospital (General Hospital Division of the Ottawa Clinic, Ontario Cancer Foundation)—3	" "
Princess Margaret Hospital (The Ontario Cancer Institute)—8	Toronto, "
St. Michael's Hospital—3	" "
Toronto General Hospital—3(s)	" "
Toronto Western Hospital—3	" "
Metropolitan General Hospital (Windsor Clinic, Ontario Cancer Foundation)—4(d)	Windsor, "
Hôpital Notre-Dame—8	Montreal, Quebec
Hôpital Saint-Luc—3	" "
Hôpital Sainte-Jeanne d'Arc—3(a)	" "
Hôtel-Dieu de Montréal—8	" "
Institut du Radium—8	" "
Montreal General Hospital—8	" "
Queen Elizabeth Hospital—3	" "
Royal Victoria Hospital—8	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
Hôpital St-François-d'Assise—3	" "
L'Hôtel-Dieu de Québec—8	" "
Postgraduate Course in Radiology, under auspices of Laval University —ten hospitals—7(d)	" "
Regina Grey Nuns' Hospital (Allan Blair Memorial Clinic)—4(d)	Regina, Sask.
University Hospital (Saskatoon Cancer Clinic)—8	Saskatchewan, Sask.

For Numerical References, see pages 747 and 748.

SPECIALTY OF SURGERY (GENERAL SURGERY)

Colonel Belcher Hospital (D.V.A.)—3 and 6	Calgary, Alberta
Edmonton General Hospital—3	Edmonton, Alberta
Misericordia Hospital—3(a)	" "
Royal Alexandra Hospital—4(k)	" "
University of Alberta Hospital—8	" "
Crease Clinic of Psychological Medicine—3(g)	Essondale, B.C.
Shaughnessy Hospital (D.V.A.)—5 and 6	Vancouver, "
St. Paul's Hospital—3(f)	" "
Vancouver General Hospital—8	" "
Victoria Veterans' Hospital (D.V.A.)—3(g) and 6	Victoria, "
St. Boniface Hospital—4	St. Boniface, Man.
Children's Hospital—3(h)	Winnipeg, Man.
Deer Lodge Hospital (D.V.A.)—5 and 6	" "
Winnipeg General Hospital—5	" "
Lancaster Hospital (D.V.A.)—3 and 6	Saint John, N.B.
Saint John General Hospital—3(j)	" " "
St. John's General Hospital—3(d)	St. John's, Nfld.
Camp Hill Hospital (D.V.A.)—5 and 6	Halifax, N.S.
Victoria General Hospital—8	" "
Hamilton General Hospitals—4(n)	Hamilton, Ontario
Canadian Forces Hospital—3(g)	Kingston, Ontario
Hôtel-Dieu Hospital—3(a)	" "
Kingston General Hospital—8	" "
St. Joseph's Hospital—3(a)	London, "
Victoria Hospital—8	" "
Westminster Hospital (D.V.A.)—5 and 6	" "
Ottawa Civic Hospital—3	Ottawa, "
Ottawa General Hospital—5(b)	" "
Hospital for Sick Children—3(h)	Toronto, "
New Mount Sinai Hospital—3(a)	" "
St. Joseph's Hospital—3	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto East General and Orthopædic Hospital—3	" "
Toronto General Hospital—8	" "
Toronto Military Hospital—3(e)	" "
Toronto Western Hospital—8	" "
Women's College Hospital—3(p)	" "
Toronto Hospital for Tuberculosis—2(d)	Weston, "
Hôtel-Dieu St-Vallier—4	Chicoutimi, Quebec
Hôpital du Sacré-Coeur—3(e)	Montreal, "
Hôpital Maisonneuve—8	" "
Hôpital Notre-Dame—8	" "
Hôpital Saint-Luc—4	" "
Hôpital Sainte-Justine—3(h)	" "
Hôtel-Dieu de Montréal—8	" "
Jewish General Hospital—4(f)	" "
Montreal Children's Hospital—3(h)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Reddy Memorial Hospital—3(a)	" "
Royal Victoria Hospital—8	" "
St. Mary's Hospital—4(n)	" "
Hôpital de l'Enfant-Jésus—8	Quebec, "
Hôpital du Saint-Sacrement—8	" "
Hôpital Ste-Foy (D.V.A.)—5 and 6	" "
Hôpital St-François-d'Assise—3	" "
L'Hôtel-Dieu de Québec—8	" "
Hôpital Général St-Vincent-de-Paul—3(e)	Sherbrooke, "
Hôpital Général de Verdun—4(a)	Verdun, "
Regina General Hospital—3(o)	Regina, Sask.
St. Paul's Hospital—3(o)	Saskatoon, Sask.
Saskatoon City Hospital—3(o)	" "
University Hospital—8	" "

SPECIALTY OF THORACIC SURGERY

Charles Camsell Indian Hospital—3(g)	Edmonton, Alberta
Vancouver General Hospital—8	Vancouver, B.C.
Willow Chest Centre—3(g)	" "
Manitoba Sanatorium—3(g)	Ninette, Manitoba
St. Boniface Sanatorium—3(g)	St. Vital, "

Nova Scotia Sanatorium—3(g)	Kentville, N.S.
Mountain Sanatorium—3(g)	Hamilton, Ontario
Kingston General Hospital—3(a)	Kingston, "
Beck Memorial Sanatorium—3(g)	London, "
Toronto General Hospital—8	Toronto, "
Toronto Hospital for Tuberculosis—3	Weston, "
Hôpital du Sacré-Cœur—3(g)	Montreal, Quebec
Hôpital Notre-Dame—3(a)	" "
Hôpital Sainte-Justine—3(g)	" "
Hôtel-Dieu de Montréal—3(a)	" "
Institut de Cardiologie de Montréal —3(g)	" "
Montreal Children's Hospital—2(d)	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Edward Laurentian Hospital—3 (Montreal and Laurentian Divisions)	" "
Royal Victoria Hospital—8	" "
L'Hôpital Laval—3(g)	Quebec, "
University Hospital—8	Saskatoon, Sask.

SPECIALTY OF UROLOGY

University of Alberta Hospital—8	Edmonton, Alberta
Shaughnessy Hospital (D.V.A.)— 5 and 6	Vancouver, B.C.
Vancouver General Hospital—8	" "
Deer Lodge Hospital (D.V.A.)— 5 and 6	Winnipeg, Manitoba
Winnipeg General Hospital—8	" "
Saint John General Hospital—3(j)	Saint John, N.B.
Camp Hill Hospital (D.V.A.)—5 and 6	Halifax, Nova Scotia
Victoria General Hospital—8	" " "
Hamilton General Hospitals—3(q)	Hamilton, Ontario
Kingston General Hospital—3	Kingston, "
Victoria Hospital—3	London, "
Ottawa Civic Hospital—3	Ottawa, "
Hospital for Sick Children—2(a)	Toronto, "
St. Joseph's Hospital—3(a)	" "
St. Michael's Hospital—8	" "
Sunnybrook Hospital (D.V.A.)—5 and 6	" "
Toronto General Hospital—8	" "
Toronto Western Hospital—8	" "
Hôtel-Dieu St-Vallier—3(a)	Chicoutimi, Quebec
Hôpital Notre-Dame—8	Montreal, Quebec
Hôtel-Dieu de Montréal—8	" "
Jewish General Hospital—3(a)	" "
Montreal Children's Hospital—2(d)	" "
Montreal General Hospital—8	" "
Queen Mary Veterans' Hospital (D.V.A.)—5 and 6	" "
Royal Victoria Hospital—8	" "
L'Hôtel-Dieu de Québec—3	Quebec, "
University Hospital—8	Saskatoon, Sask.

NUMERICAL REFERENCES

1. Part-time training—A maximum period of four months' training in which the remainder of the year is spent in resident training in an institution with approval for at least one year in the specialty concerned.
2. Six months' training.
   (a) Six months' training—limited to one trainee.
   (b) Six months' training—training is integrated as part of a university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
   (c) As 2(b) but training limited to one trainee.
   (d) Six months' training—not to be substituted for six months of the required two years of resident training in the specialty concerned in an approved hospital.
   (e) Six months' training—provisional. (College Office will provide details on request.)
3. One year's training.
   (a) One year's training—limited to one trainee.
   (b) One year's training—limited to one trainee, provided the second year of the specialty training is taken in a university centre.
   (c) One year's training—limited to one trainee—not to be substituted for one of the two required years of resident training in the specialty concerned in an approved hospital.
   (d) One year's training—limited to two trainees.
   (e) One year's training—limited to two trainees; not to be substituted for one of the two required years of resident training in the specialty concerned in an approved hospital.
   (f) One year's training—limited to three trainees.
   (g) One year's training—not to be substituted for one of the two required years of resident training in the specialty concerned in an approved hospital.
   (h) One year's training, only six months of which may apply to the two years of required residency training in the specialty.
   (i) One year's training, provided the second required year in the specialty is spent in a university teaching hospital.
   (j) One year's training. For Certification, one further year of training is approved; this second year not to be substituted for one of the two required years of resident training in the specialty concerned in an approved hospital.
   (k) One year's training—training is integrated as part of university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
   (l) One year's training—Clinical Pathology only.
   (m) One year's training—Pathological Anatomy or Pathological Anatomy and Clinical Pathology.
   (n) One year's training—Combined training in Pathological Anatomy and Clinical Pathology.
   (o) One year's training—limited to one trainee. Training is integrated as part of a university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
   (p) One year's training—limited to one trainee—not to be substituted for one of the two required years of resident training in the specialty concerned in an approved hospital. The year will be accepted as the necessary year of resident training in General Surgery for the Fellowship examination in Surgery as modified for Obstetrics and Gynæcology, and the Certification examinations in Obstetrics and Gynæcology.
   (q) One year's training—not more than six months of which can be spent in the integrated general surgical training program.
   (r) One year's training—Combined training in Pathological Anatomy and Clinical Pathology—limited to one trainee.
   (s) One year's training in Therapeutic Radiology, provided that this training is taken in conjunction with the training at the Princess Margaret Hospital, Toronto.
4. Two years' training.
   (a) Two years' training—limited to one trainee in each year.
   (b) Two years' training—limited to two trainees in each year.
   (c) Two years' training—limited to three trainees in each year.
   (d) Two years' training on condition that trainee will take an additional year of training in the specialty in an institution where training in the basic sciences may be obtained.
   (e) Two years' training—in a program of three years' training in Diagnostic and/or Therapeutic Radiology the extra year of training must be spent at another approved institution. In a program of two years in each of the subjects for double qualification one year must be spent in each of the subjects at another approved institution, preferably at a university department.
   (f) Two years' training—limited to a total of four trainees at any one time.
   (g) Two years' training—for a total of three trainees at any one time.
   (h) Two years' training—training is integrated as part of a university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
   (i) Two years' training—limited to one trainee in each year. Training is integrated as part of a university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
   (j) Two years' training—limited to two trainees in each year. Training is integrated as part of a university scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.

(k) Two years' training—optional number of trainees in the first year and one trainee in the second year.
(l) Two years' training for one trainee only.
(m) Two years' training for two trainees, one senior trainee and one junior trainee.
(n) Two years' training, the second year of which cannot be substituted for one of the two minimum required years in the specialty concerned in an approved hospital.
(o) Two years' training—two trainees in the first year and one in the second year.
(p) Two years' training in Pathology—one year Pathological Anatomy, one year Clinical Pathology.
(q) Two years' training in Pathology—one year Pathological Anatomy, one year Clinical Pathology—training is integrated as part of a University scheme of postgraduate instruction and carries the approval of the Head of the University Department concerned.
(r) Two years' training in Pathological Anatomy.

5. Three years' training.
(a) Three years' training—limited to one trainee in each year.
(b) Three years' training—limited to two trainees in each year.
(c) Three years' training—limited to two trainees each in the first and the second year, and one trainee in the third year—a total of five trainees at one time.
(d) Three years' training—one year Clinical Pathology, two years Pathological Anatomy.

6. Approval of training in Department of Veterans Affairs hospitals.
In D.V.A. hospitals there are no children, few and in some instances no female patients, and a lack of certain types of disease among male patients. For these reasons a D.V.A. hospital cannot provide a complete course of advanced graduate training in any specialty. D.V.A. hospitals are approved for advanced graduate training in medical and surgical specialties as specified for each hospital. While the approval of a D.V.A. hospital may be for two or three years of training, candidates who spend more than one year in resident training at a D.V.A. hospital are reminded *that one of the two minimum required years of resident training in the specialty concerned must be spent in an approved civilian hospital.*

7. Group approval.
(a) Group Approval — Diagnostic Radiology — Halifax, Nova Scotia.
Camp Hill Hospital, Children's Hospital, Halifax Infirmary and Halifax Tuberculosis Hospital—for full training in Diagnostic Radiology provided training in basic science is taken concurrently at Dalhousie University.
(b) Group Approval—Physical Medicine and Rehabilitation—London, Ontario.
Westminster Hospital, Victoria Hospital, War Memorial Children's Hospital—Polio Centre, St. Mary's Hospital and Woodeden Crippled Children's Centre, London—one year's training in Physical Medicine and Rehabilitation, provided that time spent at Westminster Hospital is restricted to three or four months.
(c) Group Approval—Physical Medicine and Rehabilitation—Montreal, Quebec.
Hôpital Pasteur and Rehabilitation Centre, Montreal—two years' training in Physical Medicine and Rehabilitation—limited to two trainees in each year—on condition that trainees obtain some additional training outside these two institutions.
(d) Postgraduate Course in Radiology under auspices of Laval University, Quebec, Quebec.
Course to include radiological facilities of the following ten hospitals: Hôpital Ste-Foy, Hôtel-Dieu de Québec, Hôpital du St-Sacrement, Hôpital de l'Enfant-Jésus, Hôpital St-Michel-Archange (Mastaï); Hôpital Laval (Ste-Foy), Hôpital St-François-d'Assise, Jeffery Hale Hospital, Hôtel-Dieu St-Vallier (Chicoutimi) and Hôpital St-Joseph (Trois-Rivières).
Conditions: Each trainee must be registered under the training scheme of Laval University. Length of time in larger hospitals not to exceed one year; in the small hospitals not more than six months. Each trainee must spend one year in another approved centre in Canada or abroad in his particular specialty. Those training in both Diagnostic Radiology and Therapeutic Radiology must spend one year in each specialty at another recognized centre.
(e) Psychiatric Training Program under auspices of University of Ottawa, Ottawa, Ontario—two years' approval; one year at Ottawa General Hospital and one year at other centres as arranged by the Professor of Psychiatry.
(f) Psychiatric Training Program under auspices of Queen's University, Kingston, Ontario—two years' approval for training arranged by the Professor of Psychiatry at the following hospitals: Kingston General Hospital; Hôtel-Dieu Hospital, Kingston; Ontario Hospital, Kingston; Mental Hygiene Clinic, Kingston, and Children's Hospital associated with Kingston Sunnyside Home for Disturbed Children.
(g) Group Approval—Hôpital Laval, Quebec, and La Clinique de Réhabilitation de Québec, Inc.—one year's training in Physical Medicine and Rehabilitation.
(h) Group Approval—Kingston General Hospital, Ottawa Civic Hospital and Ottawa General Hospital—each approved for one year of training in Ophthalmology for one trainee as part of a three-year joint training program in Ophthalmology.

8. Approved for full training.
(a) Approved for full training—limited to two trainees.

NOTE: We shall publish in our next issue a list of revisions in the training requirements for College examinations in a number of specialties.—Editor.

GENERAL PRACTICE

COLLEGE OF GENERAL PRACTICE (MEDICINE) OF CANADA FOURTH NATIONAL SCIENTIFIC CONVENTION

The fourth National Scientific Convention of the College of General Practice was held in Montreal February 29 to March 3, 1960. French Canadian hospitality was prominently displayed throughout the meeting through the good auspices of the Quebec chapter under the able presidency of Dr. Claude P. Gendron of Montreal. Dr. Peter A. Kinsey of Toronto and his program committee are to be congratulated for the excellence of the scientific program.

An international flavour was added to the meeting by such outstanding scientific speakers as Professor A. N. Shabanov of Moscow; Professor Raymond Villey of Caen; Dr. R. Levine of Chicago; Dr. A. P. Joslin of Boston and Dr. M. H. Erickson of Phoenix.

The simultaneous translation of the scientific program in English and French was again a feature of the meeting. As in past conventions, many doctors took advantage of the free medical examinations provided through the good offices of the Montreal General Hospital and the Sun Life Assurance Company of Canada. A continuous showing of medical films each day throughout the meeting also attracted a good audience.

The highlights of the social program included luncheon addresses by Dr. Arthur Leclerc, Minister of Health, Province of Quebec, and Dr. E. Kirk Lyon, Deputy to the President of the Canadian Medical Association. The presidential address was given by Dr. Maurice E. Hobbs of Millbrook, Ont., at the Annual Dinner on Wednesday evening. The City of Montreal provided its usual generous reception and buffet at the Châlet on Tuesday evening.

Professor Shabanov's papers elicited considerable interest. He first spoke on the organization of medical

health in the U.S.S.R. and after bringing greetings from the doctors of Russia, he indicated that the problems in Russia were the same as in other countries, and emphasized the importance of viruses and cancer. Dr. Maurice E. Hobbs read an English translation of Professor Shabanov's paper, which described briefly how medical treatment services were organized in the U.S.S.R. All people in Russia are provided free medical care through the various hospitals, polyclinics, rest homes and health resorts. There is a free referral of patients between these various medical facilities depending on the availability of the facilities and the medical needs of the patients. Doctors are practically all specialists, the nearest approach to the general practitioner in Russia being the country doctor. The internists in Russia screen the patients and refer them to the various specialists as required. Doctors are all on a full-time salary and receive special grants for postgraduate training every three to five years. There is very little freedom of choice of patient and doctor.

Dr. E. Kirk Lyon, in his luncheon address to the College, stressed the importance of medical unity in the profession. He pointed out the interdependence of general practitioners and specialists in the provision of high-quality medical services.

Dr. Maurice E. Hobbs of Millbrook, Ont., in his presidential address gave examples of the social trend in Canada and other countries, and stated that general practitioners should be prepared to provide medical services under new circumstances. Whatever their individual feelings about the welfare state or universal health insurance plans, general practitioners should do their best to ensure high-quality medical care and insist upon the privilege of treating their patients in and out of hospital.

Speaking on diabetes, Dr. Rachmiel Levine of Chicago said that the insulin needle is a sharp reminder to the individual that he has diabetes. This is good, said Dr. Levine, as the patient needs to be constantly reminded of his condition, otherwise he may put on too much weight. A patient can swallow a pill so easily that he may forget he has diabetes and then he goes off his diet. Dr. A. P. Joslin of Boston, also speaking on diabetes, said insulin users should not switch to pills. Successful treatment depends on one method used consistently day by day throughout the year.

The scientific sessions included a demonstration in the application of hypnosis to general practice; a summation of current progress in cancer research by Dr. Arthur W. Ham of the Ontario Cancer Institute; current views on arthritis by Canadian and American authorities; and a discussion of physical fitness in which Dr. Donald C. Bews reported about 40% of applicants for jobs with his company failed to meet top physical standards.

A number of interesting reports were presented at the Annual General Meeting of the College on Tuesday afternoon. Dr. J. T. McCullough, Chairman of the Committee on Membership, recommended an increased membership drive in 1960. He said the College is just holding its own at approximately 2000 members. Dr. Zacks and his Committee recommended that the College consider having a seat on the Canadian Council on Hospital Accreditation. The report of the Fellowship Committee was deferred for further study. Much debate followed on the question of whether the College should concern itself with medical economics. It was pointed out by a number of speakers that the Canadian Medical Association should speak for all segments of the profession; otherwise the profession would be divided into small ineffective groups as had happened in the past in Great Britain and other countries. The active membership fee was increased from $25.00 to $30.00.

The 1961 Scientific Assembly of the College will be held May 27 to 30 in the Civic Auditorium and Hotel Vancouver, in Vancouver. The 1962 Assembly will be aboard the S.S. *Empress of England* to Nassau and Bermuda, March 10-17. In 1963 the College scientific sessions will be held March 25-28 at the Macdonald Hotel, Edmonton. The 1964 dates are tentatively April 5-9 at Halifax, and the 1965 meeting will likely be held in Winnipeg.

The following honours and awards were made during the meeting:

UPJOHN SCHOLARSHIPS

Value $500.00

British Columbia—Dr. Gordon Lapp, Golden; Dr. E. E. Tomashewsky, Grand Forks.
Alberta—Dr. A. Ben King, Vermilion.
Saskatchewan—Dr. J. E. Knox, Maple Creek.
Manitoba—Dr. A. A. Campbell, Winnipeg.
Ontario—Dr. Peter Barg, 204 Wellington St., Wallaceburg; Dr. Kyle R. Borland, 4204 Sheppard Ave., Agincourt; Dr. John D'Arcy Bruce, 168 Essex St., Sarnia; Dr. Albert Gordon Chunn, 84 Cousins Drive, Aurora; Dr. W. Harold Orr, Erie and Main Sts., Ridgetown; Dr. Keith C. Quirk, 599 – 2nd Ave. E., Owen Sound.
Quebec—Dr. Jean-Paul Genest, Lévis; Dr. Jean-Jacques Caille, Vaudreuil; Dr. P. A. Lague, St-Hyacinthe.
New Brunswick—Dr. J. Dominique Gauthier, Shippegan.
Nova Scotia—Dr. Peter C. Gordon, Halifax.
Prince Edward Island—Dr. George Dewar, O'Leary.
Newfoundland—Dr. Edward L. Sharpe, Grand Falls Clinic, Grand Falls.

COLLEGE OF GENERAL PRACTICE BURSARIES
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Value $500.00

British Columbia—Dr. R. A. White, Oliver.
Alberta—Dr. John R. Ibberson, Calgary.
Saskatchewan—Dr. A. J. Wasylenki, Regina.
Manitoba—Dr. R. A. Jacques, St. Boniface.
Ontario—Dr. J. Maurice Welland.
Quebec—Dr. Origène Desjardins, Rivière-du-Loup.
New Brunswick—Dr. Thomas E. Nugent, Bathurst.
Nova Scotia—Dr. A. R. Prossin, Westmount North.
Prince Edward Island—Dr. L. K. Zielinski, Kensington.
Newfoundland—Dr. Hugh M. Twomey, Botwood.

Honorary Membership Certificates were granted to: Dr. Roméo Bellemare, Trois-Rivières, P.Q.; Dr. Raymond F. Farquharson, Toronto, Ont.; Dr. Robert G. Ferguson, Regina, Sask.

The new Executive of the College includes: President—Dr. F. Murray Fraser, Halifax, N.S.; President Elect—Dr. E. C. McCoy, Vancouver, B.C.; Past President—Dr. Maurice E. Hobbs, Millbrook, Ont.

Chairman of Board of Representatives: Dr. I. W. Bean, Regina, Sask.; Honorary President—Dr. M. A. Marchand, Trois-Rivières, P.Q.

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Come To Banff In June!

FOR THE

NINETY-THIRD ANNUAL MEETING OF

THE CANADIAN MEDICAL ASSOCIATION

JUNE 13 - 17, 1960

Apart from the satisfaction of hearing outstanding speakers in a well-balanced scientific program, doctor delegates and their ladies will enjoy the scenic beauty of Banff and vicinity. The meeting will be held in the Banff Springs Hotel, high in the Canadian Rockies.

In the March 5 issue of the *Canad. M. A. J.*, a preliminary program was published, showing specific data on the scientific, business and social aspects of the meeting. In the event that you plan to visit Banff this June, the following information should assist in arranging your trip:

Housing.—Owing to the large number expected to attend the meeting, may we suggest that you send in your Housing Application immediately, in order to avoid disappointment. A form for this purpose is printed on page 754 of this issue, and a list of hotels and motels appears on page 756.

Transportation to Banff.—Reduced railway fares are available to doctors and their families by presenting a special identification convention certificate to your local ticket office agent. This certificate can be obtained by dropping a line to: The Canadian Medical Association, 150 St. George Street, Toronto.

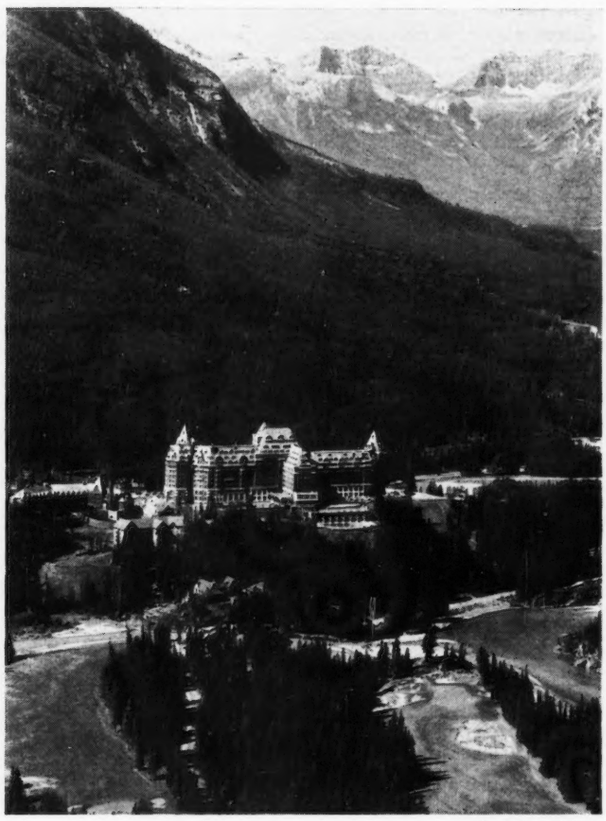
Those wishing to travel by air may arrange with the airlines for limousine service from Calgary to Banff.

Bus Transportation.—A "pick-up" service from hotels and motels in Banff to the Banff Springs Hotel will be provided through the courtesy of the Brewster Rocky Mountain Grey Lines Limited, on a trial basis on Wednesday, June 15. If sufficient people use the service, it will continue throughout the week.

Sightseeing Tours.—Everyone will wish to enjoy the scenic splendour of Banff and vicinity—and there are many interesting sight-seeing tours to make your wish a reality. As an example, here are a few trips that you will long remember: Lake Louise, Columbia Ice Field, Moraine Lake, Jasper, Emerald Lake, and Field. In addition to the panorama of mountain ranges one sees during a scenic tour, wild-life, and many larger animals native to the Rocky Mountains may be observed. A visit to the top of Sulphur Mountain, via the Gondola Lift, is also a trip worth taking.

Then too there are countless things to do in Banff: play golf or tennis, swim, or go fishing. Riding the mountain trails and hiking are also included in the many outdoor sports.

There are many things to see in Banff, such as the Cascades Rocky Garden, the Fish Hatchery, and the Park Museum.



C.P.R. Photo

Banff Springs Hotel, headquarters of the Association's Annual Meeting for this year, is located in the Rockies near the Bow River. It offers all the facilities and comfort of large city hotels plus scenic beauty which has made it world-famous.

FOR THE LADIES

Providing a wide variety of entertainment for all wives attending the 93rd Annual Meeting of the Canadian Medical Association in Banff, June 13 to 17, a tentative program will be published shortly by the women of the Alberta Division. Their aim has been to make this first convention of the 60's a memorable event.

With the famous resort offering almost every kind of activity, a visitor often finds selection difficult, for a short stay. With this problem in mind, the Committee has included in the program some of the attractions for which Banff is noted. Free time has been left for

(Continued on page 752)

The first specific aldosterone-blocking agent...

ALDACTONE™

effectively extends the medical control of edema or ascites.
It introduces a new therapeutic principle in the treatment of...

CONGESTIVE HEART FAILURE • HEPATIC CIRRHOSIS
THE NEPHROTIC SYNDROME • IDIOPATHIC EDEMA

ALDACTONE introduces a new class of therapeutic agent, the aldosterone-blocking agent providing:

> *satisfactory relief* of resistant or advanced edema even when all other agents, alone or in combination, are ineffective or are only partially effective.

A New Order of Therapeutic Activity

ALDACTONE acts by blocking the effect of aldosterone, the principal mineralocorticoid governing the reabsorption of sodium and water in the distal segment of the renal tubules.

By so doing Aldactone establishes a fundamentally new and effective approach to the control of edema or ascites, including edema resistant or unresponsive to conventional diuretic agents.

Further, because of its different site and mode of action in the renal tubules, Aldactone has a true, highly valuable synergistic activity when used with a mercurial or thiazide diuretic.

What Physicians May Expect of Aldactone

It is fully expected that Aldactone will change present medical concepts of the therapeutic limitations of managing edema. Many patients living in a greater or lesser state of edematous invalidism can now be edema-free. To others, gravely ill, Aldactone will be life-saving.

When used alone, Aldactone will produce a satisfactory diuresis in about half of those patients whose edema is resistant to conventional diuretic agents.

When Aldactone is used in a comprehensive therapeutic regimen, which includes a mercurial or a thiazide diuretic, a satisfactory diuresis and relief of edema may be expected in approximately 85 per cent of edematous patients *who would not otherwise respond.*

DOSAGE: For most adult patients the optimal dosage of Aldactone, brand of spironolactone, is 100 mg. four times daily. Aldactone should be administered for at least four or five days before appraising the initial response, since the onset of therapeutic effect is gradual when it is used alone. Aldactone manifests accelerated activity with greater response as early as the first and second days when used in combination with a mercurial or thiazide diuretic.

SUPPLIED: Aldactone is supplied as compression-coated yellow tablets of 100 mg.

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Research in the Service of Medicine

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(Continued from page 750)

those who crave more golf, riding, hiking, or swimming in fresh or sulphur pools. Time has also been provided for shopping or a stroll through Banff's many interesting shops, where fine imports or native crafts are displayed. Not far from the hotel, a terraced garden, "The Cascades of Time", will be an essential for lovers of plant life and colour photography. Here a famous collection of flowering plants grows beautifully against ancient rock strata, winding paths, tiny pools and rustic waterfalls.

For those who prefer to rest and relax, modern hotels ringed with some of the most spectacular mountains in the world provide luxurious hospitality.

To orient the topography, a short trip to the top of Sulphur Mountain, in the comfortable gondola lift, will provide a striking panorama of the region. This trip is open to both wives and husbands. In the afternoon there will be a tour of the Banff School of Fine Arts on Tunnel Mountain. Often called "The School in the Clouds," this summer campus for continuing education attracts scholars and students from many countries besides Canada. As the school will be in session, visitors may watch such classes as ballet, painting, ceramics or weaving, and have a cup of tea.

A hilarious skit, professionally directed, will be presented by the Edmonton doctors' wives following cocktails and a luncheon. An oldtime western barbecue for wives and husbands will be held under the stars on the pine-bordered grounds of the Banff Springs Hotel. Western garb or something equally informal could be tucked in for this event.

Golf may be played every day and cards turned in for competition Thursday afternoon, when the T. Eaton Company Trophy and other prizes will be presented following tea in the club house. There will be dancing every night in the beautiful ballroom of the hotel where guests may wander through the flower- and fern-filled conservatory or along the terrace overlooking the swimming pool. Coffee will be served each morning near the registration desk—a good place to make or renew friendships and plan for the day's events.

LETTER TO THE EDITOR

THE ACADEMIC YEAR

To the Editor:

Despite the experimentation in medical education which is presently being pursued, there is only one university faculty of medicine which has, to my knowledge, dared to interfere with the length of the teaching terms, and the possible shortening of the holiday period presently available to medical students; Johns Hopkins University School of Medicine has in its new curriculum drastically shortened the period of holiday available throughout the years of study.

Teachers in medical schools complain constantly of the overcrowding of the curriculum by the introduction of both new disciplines and new knowledge in older disciplines and that the time at the disposal of the student and the teacher does not permit of adequate "coverage" of the disciplines presented. Students find themselves constantly overdriven; even the time at their disposal during the medical school year does not permit those who are "slow readers" to peruse the textbooks which they are supposed to follow. The added handicap in this regard is that the brighter student, as in all forms of group learning, must travel at the pace of the slower. In substance, the increasing and increasingly complex body of knowledge in medical sciences prevents adequate exposure of the student in the time which is presently available.

To meet these difficulties there is a suggestion that the years the student spends in a medical faculty should be increased from four years to five years, plus a minimum of an intern year, to provide adequate instruction to the potential doctor. However, the present instructional year in Canada usually consists of 32 to 36 weeks only, followed by a prolonged holiday of 12 to 14 weeks during the summer, and it is the complaint of some medical teachers, particularly in the basic sciences, that this prolonged holiday is a period of regression in learning medicine, and on the student's return the first three or four weeks of the new term are required to bring him to that degree of facility of knowledge which he enjoyed at the end of the previous year. Thirty or forty years ago, there was an economic necessity for such prolonged periods of holiday, since the student was expected during this time to work at a remunerated occupation, which would provide at least part of the cost of his succeeding year at the university. Owing to various factors—lack of opportunity, lack of the skill required for highly remunerated jobs, and the increasing likelihood of subsidy by bursary for students who are likely to enter the study of medicine—the economic necessity of such prolonged holidays is no longer applicable, and it would seem reasonable that the student of medicine should conform to the custom of young people in his age-group working in other fields of endeavour, and enjoy a holiday of the same duration.

It is suggested that the medical school teaching year should consist of 45 weeks, divided into three terms of 15 weeks each, plus a week for purposes of examination, and a two-week holiday at Christmas and four weeks at midsummer; this is more generous than that enjoyed by persons of the same age-group following other avocations; such a period of instruction would, during the course of four years, gain approximately a year of study, and permit of more adequate coverage of the disciplines which are presented. It would also keep the student in contact with his medical environment over a period of almost 11 months, and bring him to a readier appreciation that he has already entered on his life-long vocation of being a student of medicine as well as a practitioner.

As suggested, there are certain inherent difficulties in the proposal; firstly, the lack of student earnings during the summer would have to be replaced by bursaries, probably provided from governmental sources, and such bursaries would necessarily be dependent upon satisfactory performance as judged by university teachers; secondly, increases in university teaching staffs would be required, which would permit voluntary teachers to be occupied only half the year with teaching duties; thirdly, teachers who have an interest in research must necessarily be given free time during the year, presently the summer holiday, to continue their research interests. Such suggestions would require increases in teaching personnel and in the overall budgets of medical schools. However, these obvious difficulties are completely outweighed by the

increased value of a continued relation of the student to the academic atmosphere, permitting continuous learning rather than the interruption by the present system of a three-month summer holiday. It would seem that this is a topic with which the Association of Canadian Medical Colleges might well immediately occupy itself.

R. R. STRUTHERS, M.D.

10 Lamport Avenue,
Apt. 409,
Toronto 5, Ont.,
February 1, 1960.

THE LONDON LETTER

(From our own correspondent)

DOCTORS' PAY

After three years' deliberation the Royal Commission on Doctors' and Dentists' Remuneration has produced a report which can only be described as disappointing. Perhaps this was inevitable, as one of their terms of reference was to assess such remuneration in relationship to that of "people engaged in connected occupations". Comparisons are apparently not only invidious: judging from the Commission's experience they merely make confusion worse confounded. Such comparisons may be satisfactory at trade union level; in attempting to evolve a fair level of remuneration for doctors they become merely invidious—and often misleading. What precisely, many are asking, is the relevance to doctors' remuneration of the fact that the Archbishop of Canterbury has a salary of £7500?

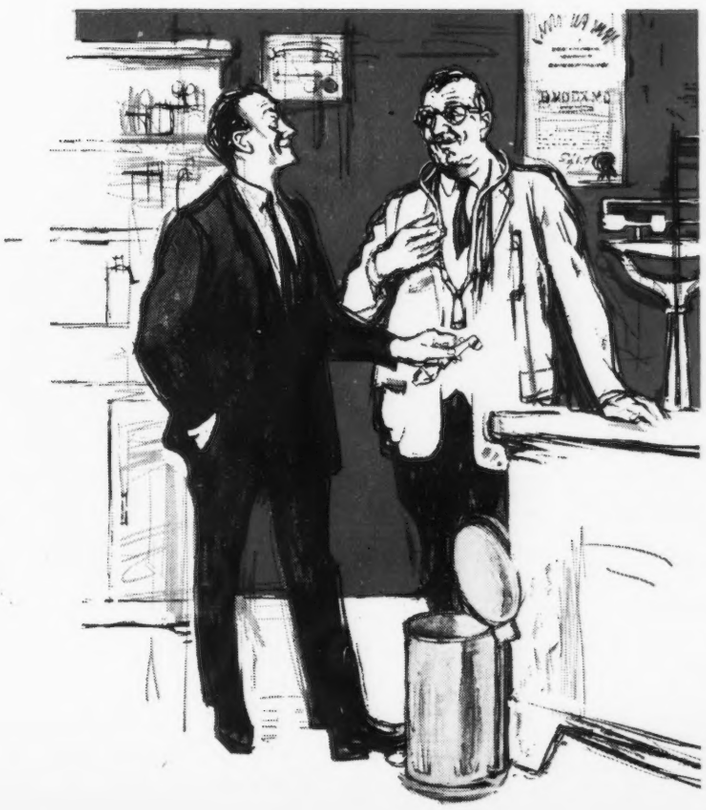
Having devoted so much time to trying to find out what is the rate of remuneration in other professions, the Commission would appear to have had little time to devote to the particular problem of how general practitioners can be rewarded financially according to the quality, rather than the quantity, of their work. The problem may well be insoluble in a National Health Service in which remuneration is by capitation fee, and not by fee for service, but many are regretting the fact that the Commission did not devote more time to this problem and less to what the Jones's were earning. Admittedly, there is a half-hearted recommendation of a system of merit awards for general practitioners, comparable to those already paid to consultants, but this is the one form of dealing with the problem that has so far been strongly opposed by the majority of family doctors.

From the short-term point of view what the profession, and particularly general practitioners, receive is a recommendation of an immediate and retrospective rise in remuneration. This increase is reasonably generous, but what the Commission appears to have overlooked is that it is not so much remuneration, as conditions of service, which require overhauling if the country is to obtain a contented medical service.

DOCTORS' PRESCRIPTIONS

In an attempt to stem the steady increase in the nation's drug bill, all family doctors in the National

(Continued on page 757)



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HOUSING APPLICATION FORM

93rd Annual Meeting, C.M.A.
Banff, June 13 - 17, 1960

Dr. P. G. Costigan,
Chairman, Committee on Housing, C.M.A.,
Box 1080, Banff, Alberta.

Please reserve the following accommodation:

.....Double room (bath or shower) Twin beds..... Double bed.....

.....Room for.....person(s) (bath or shower)

.....Motel Unit for.....person(s) (bath or shower)

In view of the large attendance expected, the hotels have few, if any, single rooms available. It might be to your advantage to share a room with another member. Please mention below the name of the person with whom you would like to share your accommodation; otherwise assignment will be made by the Housing Committee.

Names of persons who will occupy the accommodation requested above:
(Kindly print names and addresses.)

NAMES (Dr. and Mrs.).....ADDRESS(ES).....

.....

I (we) will arrive in Banff on June.....at.....a.m./p.m.

I (we) will depart from Banff on June.....at.....a.m./p.m.

Travelling by: Automobile..... Train..... Bus.....

Please name accommodation desired and check choice*:

	First	Second	Third
Hotel:	.....	.....	.....
Motel:	.....	.....	.....

NAME.....

ADDRESS.....

.....

TELEPHONE No.....

*A list of hotels and motels is shown on page 756 with daily rates.

N.B.: Confirmation of housing will be made direct from hotel or motel.

THIS WILL CONSTITUTE YOUR ADVANCE REGISTRATION FOR THE MEETING.

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PENICILLIN-FREE POLIOMYELITIS VACCINE

POLIOMYELITIS VACCINE

Poliomyelitis Vaccine as prepared by the Connaught Medical Research Laboratories is now free of penicillin, as are also the following combined preparations:

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Diphtheria and Tetanus Toxoids
combined with
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For the immunization of Infants and Pre-school children ONLY. NOT for school children, adolescents or adults.

DT POLIO VACCINE

Diphtheria and Tetanus Toxoids
combined with
Poliomyelitis Vaccine

For REINFORCING doses only in school children. NOT for older adolescents or for adults.

TETANUS-POLIO VACCINE

Tetanus Toxoid and Poliomyelitis Vaccine (Combined)

For the immunization of adults against both tetanus and poliomyelitis.

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Canad. M. A. J.
April 2, 1960, vol. 82

HOTELS AND MOTELS AVAILABLE FOR ANNUAL MEETING, BANFF, ALBERTA, JUNE 13 - 17, 1960

Daily rates

ALPINE MOTEL

Two-room units, two double beds, shower baths, kitchens—four persons	$14.00
Three-room unit, three double beds, shower bath, kitchen—six persons	18.00
Two-room units with twin beds, shower baths—four persons	14.00
One-room unit with double bed, tub bath—two persons	10.00

ARROW HOTEL

Double bed and shower bath	$10.00
Twin beds and tub bath	12.00
Suites—consisting of two twin-bedded rooms and tub bath	20.00

BANFF SCHOOL OF FINE ARTS

Administration Bldg.—Twin bedroom with bath—per person	$ 5.00
Chalets—Twin bedroom with bath—per person	4.00

BANFF SPRINGS HOTEL

Per person in single room daily including meals	$20.00
Per person (two in a room) daily including meals	17.00
Per person (three in a room) daily including meals	16.50
Per person (four in a room) daily including meals	15.50
Per person (five in a room) daily including meals	15.00
Suite rates on American Plan. An additional charge is made for the parlour and the regular American Plan rate applies to the bedrooms.	
Suites—two bedrooms and parlour—Parlours are daily additional	35.00
and daily additional	30.00
Suites—one bedroom and parlour—Parlours are daily additional	30.00
and daily additional	25.00

BECKER'S BUNGALOWS

Each bungalow contains individual log fireplace, shower bath and kitchenette	
Double bed—bungalow	$10.00
Twin beds—bungalow	12.00
Two double beds—bungalow	14.00

BEL-PLAZA MOTEL

Double bed and bath—2 persons, per day	$ 9.00
Double bed and bath—2 persons, per day	10.00
Twin beds and bath—2 persons, per day	11.00
Two bedrooms and bath, 4 persons, per day	12.00
Two bedrooms and bath, 4 persons, per day	14.00
2-bedroom and sitting room and bath, per day	16.00
Double bedroom and twin-bed sitting, per day	17.00
Two bedrooms, living room and kitchenette and bath—6 persons, per day	18.00
Double bed and bath	11.00
Twin bed and bath	12.00
(Each additional person)	1.50

BREWSTER MOTEL

Two double beds, dressing room and bath—two persons	$12.00

Daily rates

CASCADE HOTEL

Twin-bedded rooms with private toilet and basin.	
Twin-bedded rooms with private toilet and basin and TV.	
Double or twin-bedded rooms with private bath.	

KING EDWARD HOTEL

Twin-bedded rooms with private bath.	
Double-bedded rooms with private bath.	
Twin-bedded rooms with washbasin only.	
Double-bedded rooms with washbasin only.	

CHARLTON'S CEDAR COURT

Cabins with two double beds in separate rooms with no cooking—showers—per night	$12.00
Cabins with two double beds in separate rooms and cooking. Some with shower and some with bath—per night	12.00
Cabins with twin beds in the bedroom and a double bed in the living room—cooking, shower	14.00
Cabins with a double bed in the bedroom and Duo-bed in the living room, cooking, some with shower and some with bath	14.00

THE HOMESTEAD MOTEL

Singles with bath	$7-$ 8.00
Twin-bedded rooms	$9-$10.00

THE GAMMON MOTEL

Twin-bedded rooms each with combination bath and shower	$12.00

MOUNT ROYAL MOTEL

Twin beds with bath	$13.00
Double with bath	13.00
Twin with bath	8.50
Twin with bath	13.00
Double with bath	10.00
Suite—connecting bath—4 persons	16.00
Suite—connecting bath—4 persons	17.00

KEN-RIC MOTEL LTD. (Gehman's)

Double beds and private bathroom, per day	$ 7.00
Twin beds and private bathroom, per day	8.00

RAINBOW CHALETS

Forty-six units, with complete bathrooms (stall showers) and automatic gas heating units. All but 3 units have kitchenettes.	$8-$21.00

MOUNTVIEW BUNGALOWS

Twenty-two units accommodating from 2 to 8 persons; 16 units have kitchens.	$10-$16.00
(for 4 persons; $1.50 each extra)	

SCRATCH'S BUNGALOWS

TIMBERLINE HOTEL

Large bedsitting rooms—some 4 persons each—private bath and/or shower.	
Two-room suite, private bath and/or shower.	
Twin-bedded rooms—private bath and/or shower.	

THE LONDON LETTER

(Continued from page 753)

Health Service are being asked voluntarily to limit the quantities of drugs they prescribe so that they usually do not exceed one week's supply, except in chronic or special cases. This is one of the recommendations which the Ministry of Health, in agreement with the British Medical Association, are bringing to the notice of all doctors in the National Health Service. Other recommendations are that official titles should be used in prescribing in preference to proprietary names, and that when a brand name is used the prescriber should be convinced of the superiority of the particular preparation by personal experience or published evidence, not by unsubstantiated claims made in advertisements. A further recommendation is that until the results of clinical trials are known, practitioners should, as a general rule, prescribe new drugs only if they are certain the existing drugs have failed. Finally, a comprehensive handbook on prescribing is being prepared for circulation to all general practitioners. This is to contain much of the "British National Formulary", facts concerning the comparative costs of standard and proprietary preparations, and other information about prescribing.

Training in General Practice

An interesting experiment in training in general practice is being carried out in Hampshire, with financial backing from the Nuffield Provincial Hospitals Trust. This consists of a two-year appointment. The first year is spent in hospital where the graduate holds a supernumerary appointment, paid at registrar rates, and spends time in different departments. This includes six months in the obstetric department if he has not already held such a post. In his second year he is attached to a general practitioner as a "trainee", and at the same time he is given experience in local authority health services. The aim of the experiment is twofold. The first is to produce a general practitioner who is well trained in all aspects of general practice. The second is to obtain experience as to how best this objective can be achieved.

Polio Vaccination

By the end of last year, registrations for poliomyelitis vaccination had passed the 13-million mark. Nearly all of these had received two injections, and over seven million had received three. The age-limit for vaccination is now to be raised to cover all persons who at the time of their application for vaccination are under 40. In addition, vaccination is to be made available to persons visiting, or going to live in, countries outside Europe other than Canada and the United States; practising dentists and their assistants; practising nurses even though not in hospital; and public health staff who may come in contact with poliomyelitis. All the families of these new groups will be included. The extension of poliomyelitis vaccination to the first of these new groups will be particularly appreciated because, as Sir George McRobert has recently pointed out, "since the introduction of proguanil the greatest risk to which the European is exposed anywhere in the tropics is paralytic poliomyelitis".

WILLIAM A. R. THOMSON

London, March 1960.

HE'S FREE FROM SYMPTOMS AND SIDE EFFECTS ON MEDROL*

The asthmatic patient symptom-free under therapy with Medrol will rarely present, even to the practiced clinical eye, any of the disturbing changes in appearance, behavior or metabolism often associated with corticotherapy.

Fewer and less serious side reactions on therapeutically effective doses is the hallmark of Medrol.

Supplied as 2 and 4 mg. tablets in bottles of 30 and 100.

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the *only* effect this iron produces

is a consistent hemoglobin response

patients on Sym-Iron report: no gastric upset, no black stools, no constipation or diarrhea

Sym-Iron (formerly Simron) is iron (ferrous gluconate) contained in a dramatically different agent* which facilitates iron absorption.

Eliminates cause of iron intolerance—Sym-Iron increases iron absorption in the G. I. tract. That's why it cancels the need for "iron overload". This greater absorption of usable iron virtually eliminates nausea, G. I. upset, or black stools. In a recent series of 40 Sym-Iron treated patients[1], only one reported side effects.

Patients who "can't take iron"—now can—Sym-Iron is preferred wherever iron is indicated. Especially useful in patients who can't tolerate other iron therapies—gravida, duodenal ulcer, colitis, for example—where gastric upset is discomforting and black stools may mask a serious condition.

Prescribe one capsule t.i.d. between meals. In bottles of 100 soft, gelatin capsules, containing 10 mg. ferrous gluconate and Sacagen.

*Sacagen—special absorption agent.

1) Ausman, D. C.: J. Am. Geriatric Soc. 7: 268, 1959.

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THE PARENT SCHOOL ORGANIZATION FOR EXCEPTIONAL CHILDREN OF THE PROVINCIAL TRAINING SCHOOL AT RED DEER, HAVE INAUGURATED AN ANNUAL AWARD OF THREE PRIZES OF $100.00 EACH, TO PERSONS WHO HAVE DONE ORIGINAL RESEARCH IN THE FIELD OF MENTAL DEFICIENCY.

This may be in the field of:

Medicine	**Psychiatry**
Psychology	**Education**
Genetics	**Eugenics**

This work should have been done within the past twelve months and manuscripts or reprints of publications will be accepted from professionally qualified people in these various fields. These manuscripts should be submitted in six copies to the Chairman, Research Committee, Parent School Organization for Exceptional Children, Box 580, Red Deer, Alberta, Canada, not later than July 31st, 1960. The winners of the awards will be announced at a later date.

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BOOK REVIEWS

THE NATURAL HISTORY OF CEREBRAL PALSY. Bronson Crothers and Richmond S. Paine, Harvard University. 299 pp. Illust. Harvard University Press, Cambridge, Mass.; S. J. Reginald Saunders and Company Limited, Toronto, 1959. $7.40.

As cerebral palsy is a life-long disorder to the patient, he who reports on it best needs to have spent his own life in observation of the cerebral-palsied from their birth to their maturity. In giving us this heritage the late Bronson Crothers has, with the aid of Richmond Paine, built his own monument on which is inscribed the keynote of the book, "serenity". Cerebral palsy is a chaotic condition, certainly to the patient and his parents, and it will not be alleviated by those who are only of good heart. This book is an encyclopædia of rational, meaningful information and no one with less than Dr. Bronson Crothers' experience should attempt to deal with the cerebral-palsied without it at his elbow. Moreover, it is easy and delightful reading, for the authors present their knowledge in a style that is in no way pedestrian.

The cases on which the evidence rests number 1821 and are those seen by the senior author or his direct associates between the years 1930 and 1950. Of this large group 1601 were successfully followed up by re-examination, by parental interview, or both. In dealing with cerebral palsy the most time and effort are spent in treatment of motor disabilities. The authors, without deprecating the validity of treatment, suggest that the success of it should not be gauged by comparison with the status before its institution but rather that it should be considered in relation to predictable changes in development. In speaking of the group with extrapyramidal disturbances following kernicterus whom the authors permitted to use any effective methods which increase mobility, they say this, "It is our conviction that these children are just as likely to progress from the motor standpoint and that they are more ingenious and more independent than those subjected to authoritative and ritualistic treatment."

A full quarter of the book is devoted to the emotional factors

(Continued on page 25)

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. . . Rapid, effective elevation of the prothrombin time—18 - 36 hours.
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. . . Predictable small-dosage maintenance—5 to 12½ mg. daily.
. . . Responds to Vitamin K therapy in haemorrhage and in abnormally elevated prothrombin times without haemorrhage.
. . . Economically priced for long-term therapy.

Supplied: Tablets 5 mg. green, 10 mg. yellow, 25 mg. pink . . . bottles of 25 and 100.

Parenteral: Intravenous—Intramuscular, package contains 75 mg. Warnerin in a sterile rubber-capped vial and a 3 c.c. ampoule distilled water.

WARNER
CHILCOTT
TORONTO, ONTARIO

BOOK REVIEWS

(Continued from page 23)

in cerebral palsy. One of the authors' conclusions is, "The success of management is assured only when the child arrives at maturity with confidence and maximal ability to compete."

FERMENTE – HORMONE – VITAMINE, und die Beziehungen dieser Wirkstoffe Zueinander. In Three Volumes. Edited by Robert Ammon and Wilhelm Dirscherl, Volume I, Fermente (Enzymes). R. Ammon and K. Myrback. 564 pp. 3rd ed. Georg Thieme Verlag, Stuttgart, W. Germany; Intercontinental Medical Book Corporation, New York, 1959. $19.45.

For those who can read German, this book provides an excellent summary of our knowledge in the rapidly expanding field of the enzymes.

Over 20 years ago, the first edition of *Fermente, Hormone, Vitamine und die Beziehungen dieser Wirkstoffe Zueinander* by Ammon and Dirscherl appeared as a single volume of about four hundred pages (1938). It increased to eleven hundred pages in the second edition of 1948, and has now grown to three volumes of which this is the first. Volume II will deal with hormones; Volume III with vitamins and with the interrelationships of these three groups of physiologically active substances.

The appearance of Volume I of this third edition will be welcomed by those able to take advantage of its fine presentation of modern information, both fundamental and applied, about enzymes. In the section dealing with technological applications, the physician will find a summary of the uses of enzymes in clinical diagnosis and suggested uses in therapy.

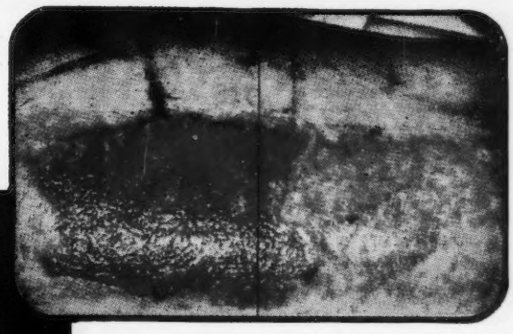
Professor Robert Ammon of the Institute of Physiological Chemistry at the University of the Saarland (Homberg) has provided the first 338 pages. A concise historical review and a section on definitions leads to accounts of the general properties, occurrence, and crystallization of enzymes. Inhibitors and activators (10 pages), reaction mechanisms (5 pages) and energetics of enzyme reactions (6 pages) are considered, and 23 pages are devoted to the practical uses of enzymes. It is in this section that Ammon reviews a number of papers dealing with the clinical significance of alterations in the activity of certain enzymes found in whole blood, serum or cells. For example, aldolase activity is demonstrable in the serum of patients with progressive muscular dystrophy as well as in acute hepatitis and after myocardial infarction. Other enzymes are also altered in the serum after a myocardial infarct; namely, phosphohexokinase, lactic acid dehydrogenase and glutamic acid-oxaloacetic acid transaminase. Therapeutic applications of pepsin, papain, thrombin, hyaluronidase, urease, cytochrome C, histaminase, uricase, carbonic anhydrase and other enzymes are discussed, as are the clinical uses of certain inhibitors of enzymes; for example, disulfiram (which blocks the oxidation of acetaldehyde, used in combating chronic alcoholism), and acetazolamide (an inhibitor of carbonic

(Continued on page 26)

Versatile topical

FURACIN CREAM

in a new bactericidal form



Skin graft donor site after 2 weeks' treatment with . .

petrolatum gauze—still largely granulation tissue | FURACIN gauze—completely epithelialized

TOPICAL—For postoperative anorectal use, as well as for application to general infected areas.

INDICATIONS:

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For bacterial (nonspecific) vaginitis and cervicitis.

COMPOSITION—Furacin (brand of nitrofurazone) 0.2% in a fine cream base, water-miscible and self-emulsifying in body fluids.

advantages

(1) Wide-range bactericide effective in exudates and organic debris.
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(3) Noxtoxic to healing tissue.
(4) Slightly acid pH (5.0) helps restore normal physiologic balance in the vagina.
(5) Odorless and esthetically pleasing.

HOW SUPPLIED—Tubes of 3 oz., with or without plastic plunger-type vaginal applicator.

DOSAGE AND ADMINISTRATION—Intravaginally, the usual dosage is 1 applicatorful, morning and night. Topically—apply to infected areas.

References (1) Weiner, A. L., and Fixler, Z. C.: J.A.M.A. 169:346, 1959. (2) Nesbitt, R. E. L., Jr.: Investigator's report to the Medical Department, Eaton Laboratories. (3) Jennett, R. J.: Investigators report to the Medical Department, Eaton Laboratories.

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BOOK REVIEWS

(Continued from page 25)

anhydrase) which has proved useful in treating some forms of epilepsy.

After the 98-page general introduction, Ammon deals at length (240 pages) with the hydrolases; namely, enzymes that split compounds into two or more constituents by adding water—for example, esterases, lipases and wax-splitting enzymes, enzymes hydrolyzing phospholipids, pectins, tannins, chlorophylls, alkaloids, esters of cholesterol and esters of phosphoric acid and sulphuric acid, di- and poly-saccharides, glucosides, peptides, proteins, nucleotides and nucleosides and other complex tissue components.

Professor Karl Myrbäck of the Institute for Organic Chemistry and Biochemistry at the University of Stockholm has contributed the sections dealing with transferases (68 pages), isomerases (five pages), lyases (16 pages), decarboxylations (17 pages), and biological oxidation (74 pages). Myrbäck has provided shorter sections on alcoholic fermentation, glycolysis, alternative paths of carbohydrate breakdown, the citric acid cycle, oxidative phosphorylation, the fatty acid cycle and photosynthesis.

The type is clear and the paper is of good quality. The book is possibly a little too expensive to be purchased by many whose knowledge of German is limited, but it should be available in every reference library.

HYPNOSIS IN ANESTHESIOLOGY. Milton J. Marmer, Department of Anesthesia, University of California. 150 pp. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $7.50.

This short volume is a most satisfactory treatise of the subject of hypnosis for the anæthesiologist. The history, psychology and physiology of hypnosis are dealt with in a clear manner.

The choice of patients and the induction of the trance state and its application to patients, both adults and children, are included.

A number of case histories are presented and the use of hypnosis combined with standard anæsthetic techniques is discussed.

This book is recommended to those interested in the application of hypnosis to anæsthesia; the lessons in relaxation are particularly apt. Hypnotism is discussed for what it really is—applied suggestion.

PROBLEMES D'ORGANISATION ET DE FONCTIONS CHEZ LES BACTERIES ET LES VIRUS (Problems in Organization and Functions in Bacteria and Viruses). J. André Thomas, Sorbonne, Paris. 386 pp. Illust. Masson & Cie, Paris, 1958. 5.000 fr.

Dans le cadre des Exposés Actuels de Biologie Cellulaire de la collection Biocytologia, a paru en 1958, sous la direction de J. André Thomas, "Problème d'organisation et de fonctions chez les bactéries et les virus". Trois autres volumes avaient précédé l'édition présente et on annonce un cinquième volume pour 1959. Les hauts spécialistes qui ont contribué à cet ouvrage jouissent d'une renommée internationale. Les pathologistes et les virologistes trouveront dans cette collection des mises au point critiques d'orientation, sortes de revues complètes couvrant les sujets à l'ordre du jour dans le domaine de la cytophysiologie des bactéries et des "inframicrobes".

Les six premiers chapitres portent sur la cytophysiologie et l'histoire

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Following oral dosage of 75 cc. Elixophyllin, mean blood levels of theophylline at 15 minutes[1] exceed those produced by 300 mg. aminophylline I.V.[2]—and therapeutically effective[3] levels persist for hours.[1]

- No sympathomimetic stimulation
- No barbiturate depression
- No suppression of adrenal function

Each tablespoonful (15 cc.) contains theophylline 80 mg. (equivalent to 100 mg. aminophylline) in a hydroalcoholic vehicle (alcohol 20%).

For acute attacks: Single dose of 75 cc. for adults; 0.5 cc. per lb. of body weight for children.

For 24 hour control: For adults 45 cc. doses before breakfast, at 3 P.M., and before retiring; after two days, 30 cc. doses. Children, 1st 6 doses 0.3 cc.—then 0.2 cc. (per lb. of body weight) as above.

1. Schluger, J. et al.: Am. J. Med. Sci. 233:296, 1957.
2. Bradwell, E. K.: Acta med. scand. 146:123, 1953.
3. Truitt, E. B. et al: J. Pharm. Exp. Ther. 100:309, 1950.

Sherman Laboratories
Windsor, Ontario

naturelle des bactéries et des inframicrobes. Un deuxième groupe de trois chapitres traite de questions essentielles de virologie, allant de la biophysique à l'immunologie et à la cytophysiologie pathologique.

Monsieur A. R. Prévot passe systématiquement en revue les éléments cytophysiologiques de l'organisation de la cellule bactérienne, chacun de ces éléments étant analysé, comme critère de valeur plus ou moins grade, d'un caractère taxonomique. Il définit l'espèce bactérienne et expose en 25 pages le tableau résumé de la classification de l'embranchement des schizomycètes telle qu'il la conçoit à partir des fondements cytophysiologiques.

Monsieur Paul Giroud et sa collaboratrice, madame L. Dumas, pénètrent dans le monde des inframicrobes, des rickettsiales et des pneumoniales. Monsieur Paul Hauduroy aborde le sujet controversé des cycles filtrants des bactéries et, dans un second chapitre, expose une vue d'ensemble du cycle des formes dites "L" des bactéries.

Monsieur R. Vendrely résume nos connaissances sur les nucléoprotéines des bactéries et étudie quantitativement le partage des acides désoxyribonucléiques et ribonucléiques chez les microorganismes.

Monsieur J. Barraud traite de la cristallographie et de l'organisation des virus et discute des fondements d'une théorie structurale de l'organisation des virus. Monsieur C. Hanoun analyse systématiquement le pouvoir antigénique et la spécificité des facteurs antigéniques des virus.

Enfin, monsieur P. Lépine aborde les aspects de la reproduction des virus en rapport avec les structures cellulaires et envisage de façon originale les relations entre les structures cellulaires et l'autoreproduction des virus.

L'ouvrage est pourvu de bonnes illustrations et d'imposantes bibliographies à chaque chapitre. La présentation en est aérée et la lecture facile. Les multiples acquisitions récentes venues de la physicochimie, de la cytophysiologie et de la pathologie peuvent sembler disparates et difficiles à confronter, mais comme par magie, les auteurs précités nous en offrent une synthèse remarquable, utile au spécialiste comme au professeur et à l'étudiant.

MEDICAL NEWS *in brief*

DANGERS IN THE USE OF DIURETICS IN CHRONIC GLOMERULONEPHRITIS

The older generation of physicians brought up in the use of mercurial diuretics were fully aware of the nephrotoxic effects of these drugs and were careful not to use them in patients with chronic glomerulonephritis unless absolutely forced to do so. Other diuretics of that era, such as the xanthines, were of comparatively limited value, and it was with great rejoicing that the newer diuretics were welcomed by the medical profession, as they appeared to be safe to use, not only in mild kidney damage, but also in œdema due to chronic glomerulonephritis. As to chlorothiazide and hydrochlorothiazide, the literature contains many reports on their value and their side effects; of the latter some are inevitable,

(Continued on page 28)

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COSA-TETRACYN SYRUP AND PEDIATRIC DROPS

How to win small patients and influence recovery.

Patient acceptance because Cosa-Tetracyn has the appeal of fresh fruit flavour.
From the professional point of view, you can be sure of Cosa-Tetracyn's decisive action —well-tolerated and preconstituted for uniform potency, efficacy and taste appeal.

Syrup: 125 mg. tetracycline; 125 mg. n-acetylglucosamine per 5 cc. 60 cc. and 16 oz. bottles.
Pediatric drops: 100 mg. tetracycline; 100 mg. n-acetylglucosamine per cc. 10 cc. bottle with dropper.

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MEDICAL NEWS *in brief*

(Continued from page 27)

particularly sodium and potassium loss. It is obvious that in cases where diminished ability to conserve Na, K, and Cl ions exists, the administration of such diuretics may increase still further the loss of these electrolytes.

Two such cases are presented by Friedman and associates of Brooklyn, New York (*Arch. Int. Med.*, 105: 7, 1960). In the first case, a 29-year-old woman with known glomerulonephritis of several years' duration was readmitted four years after a known hypertensive episode, and three weeks after being discharged on chlorothiazide 0.5 g. daily together with other antihypertensive agents (hydralazine, reserpine) and a salt-restricted diet. During these three weeks she developed weakness, nausea and anorexia and her blood pressure dropped to 110/75 mm. Hg. There was generalized muscular weakness, the hæmoglobin was 7.0 g. %, and the specific gravity of the urine was 1.008 with 4-plus albuminuria and hæmaturia. A marked reduction of serum sodium, potassium and chloride levels was confirmed by flame photometry, and, after replacement of the electrolytes, she improved clinically within 48 hours. The second case was that of a 24-year-old woman with an essentially similar history. She was given 1 g. of chlorothiazide daily for three weeks during which she developed progressive weakness, anorexia, nausea and vomiting with paræsthesias of the fingers. Her cardiac rhythm was bigeminal, although she had not received digitalis. Again, lowered serum sodium, potassium and chloride levels and nitrogen retention were found. Replacement of electrolytes resulted in prompt clinical improvement, and laboratory findings also showed progressive correction of electrolytes and return to normal of the nitrogen value.

The authors warn against the excessive depletion of electrolytes in the body, which they were able to prove in these two cases by measuring the total exchangeable sodium and potassium by the use of radioactive sodium and potassium. They also rightly point to the danger of significant reduction in blood pressure in cases of chronic glomerulonephritis, as this may still further impair renal function. It is a pity that the authors did not have the opportunity to assess the apparently lesser tendency to potassium excretion of hydrochlorothiazide in these cases. Chlorothiazide and hydrochlorothiazide may still have a place in the treatment of chronic glomerulonephritis since, after all, all the other drugs have also only limited value. If used for reduction of œdema, they should be administered for short periods of time to allow for recovery of electrolytes. Oral replacement of these electrolytes may also prevent serious depletion.

CANADIAN CONFERENCE ON EDUCATION

Some interesting facts have been brought out in the recent Canadian Education Week. For example, it is shown that this year, 1959-60, there are 155,000 teaching posts in Canadian elementary and secondary schools with only 110,000 qualified teachers available. Next year there will be 162,000 teaching posts and only 115,000 quali-

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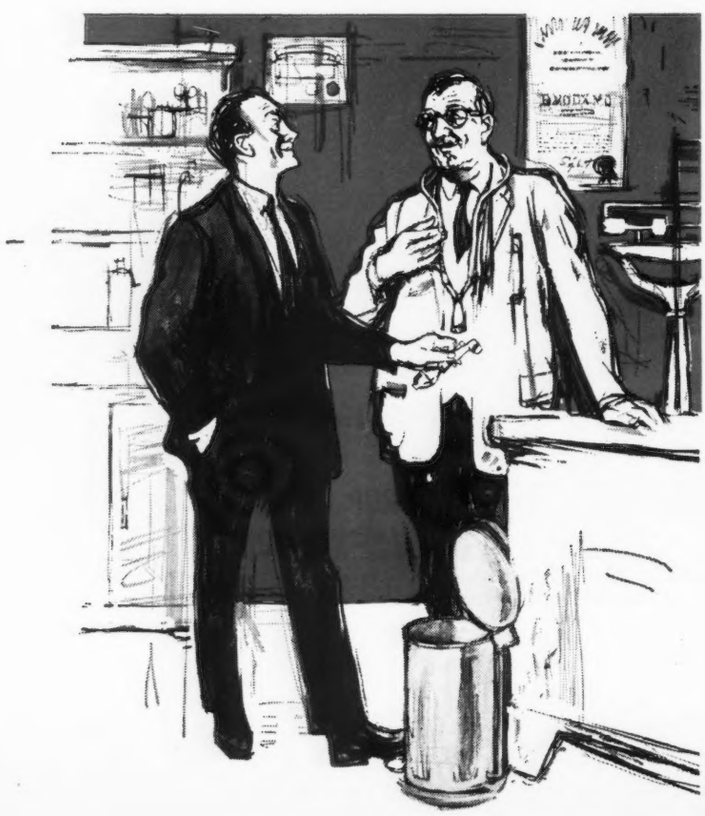

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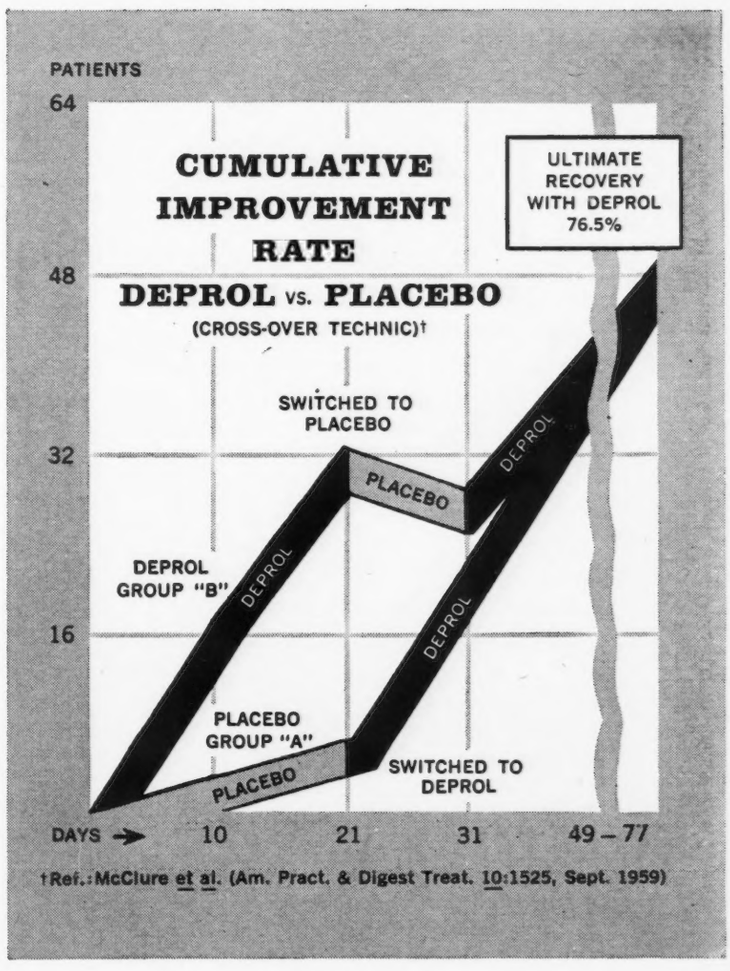

BIBLIOGRAPHY *(11 clinical studies, 764 patients):*

1. Alexander, L. (35 patients): Chemotherapy of depression – Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Bateman, J. C. and Carlton, H. N. (50 patients): Meprobamate and benactyzine hydrochloride (Deprol) as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy 6:648, Nov. 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulito, F. (77 patients): Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** Breitner, C. (31 patients): On mental depressions. Dis. Nerv. System 20:142, (Section Two), May 1959. **5.** Landman, M. E. (50 patients): Choosing the right drug for the patient. Submitted for publication, 1960. **6.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresia, G. B. (128 patients): Treatment of depression—New technics and therapy. Am. Pract. & Digest Treat. 10:1525, Sept. 1959. **7.** Pennington, V. M. (135 patients): Meprobamate-benactyzine (Deprol) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **8.** Rickels, K. and Ewing, J. H. (35 patients): Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **9.** Ruchwarger, A. (87 patients): Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **10.** Settel, E. (52 patients): Treatment of depression in the elderly with a meprobamate-benactyzine hydrochloride combination (Deprol). Antibiotic Med. & Clin. Therapy 7:28, Jan. 1960. **11.** Splitter, S. R. (84 patients): The care of the anxious and the depressed. Submitted for publication, 1959.

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MEDICAL NEWS *in brief*

(Continued from page 28)

fied teachers will likely be available, so that next year we will probably be short about 47,000 qualified teachers. Again, the average cost of a year at university in Canada in 1956-57 was $1270 and in 1958-59, $1400 – that is, $130 more. It is shown that in spite of some increase in financial assistance to cover this deficit, the extra cost is still not fully met. Again, the enrolments show a steady rise from year to year. In 1950 they were 68,300 and in 1960 it is estimated that they will be 100,900.

—

TUBERCULOSIS IN TAIWAN (FORMOSA)

Taiwan is a group of islands in the western Pacific Ocean near the China mainland with a population of approximately 10 million. It is economically underdeveloped. The prevalence of tuberculosis is high and the medical facilities, although better than in nearby countries, are far from adequate by Western standards. Trained workers are few.

T'ao (*Am. Rev. Respiratory Dis.*, 80: 359, 1959) reports that beginning in 1950, a planned tuberculosis control program has been carried out. Owing to the high prevalence of infection in the islands, a mass BCG vaccination campaign was begun. Up to the end of 1958, more than 45% of the population less than 25 years of age were vaccinated. A case-finding program was started in September 1953. From July 1957 to June 1958, a survey to determine the prevalence of pulmonary tuberculosis, based on subjects selected at random, was carried out. The over-all prevalence of pulmonary tuberculosis was about 2% roentgenographically and 0.5% bacteriologically.

Beginning in March 1957, through existing health centres and stations, free isoniazid was provided for self-administration for a period of at least one year to all who had tuberculosis proved bacteriologically. A central registry of infectious cases has also been set up.

Domiciliary chemotherapy with multiple drugs was started early in 1959. Local tuberculosis clinics for follow-up care and observation are being organized in each health district. The tuberculosis mortality rate in Taiwan has declined from 285 per 100,000 in 1947 to about 60 per 100,000 in 1957.

—

POSTGRADUATE COURSE IN DERMATOLOGY

The American College of Physicians announces a postgraduate course in dermatology for the internist to be held April 25-29, 1960, at the University of Michigan, Ann Arbor, Michigan. The guest faculty will include Drs. L. A. Brunsting of the Mayo Clinic and A. B. Lerner of Yale University School of Medicine.

Although some of the common dermatoses will be discussed, major emphasis will be placed on those diseases which fall in the province of both the dermatologist and internist. There will also be emphasis on certain special subjects such as the physiology of pigmentation, the specific antigen tests for syphilis, and the cutaneous forms of the porphyrias. Registration should be made through the Executive Offices, The American College of Physi-

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POISON CONTROL CENTRES

Deaths due to accidental chemical poisoning have constituted a major public health problem, the severity of which has been lessened recently through the operation of poison control centres. Originating in Chicago five years ago, there are now 200 centres operating in the United States and approximately 35 in Canada. Robert J. Imrie, director of the centre established April 1957 at the Hospital for Sick Children, Toronto, Ontario, has explained its operation and objectives, and outlined the experience of the past 18 months (*Canad. Hosp.*, 36: 50, 1959).

The program is both active and educational. It comprises (1) handling of enquiries from hospitals, family physicians, lay public and various community agencies; (2) provision to practising physicians and hospitals of reliable, up-to-date information on the toxic ingredients in chemical substances, making available diagnostic facilities as indicated, and recommending therapy; (3) conducting complete epidemiological investigation through follow-up reporting and home visiting by public health nurses, analyzing the collected data and forming sound preventive measures; (4) provision of consultant services to other existing, newly created, and planned centres for poison control throughout the country; (5) provision of information to various agencies and activities; (6) education of public and community.

Approximately 1500 cases of poisoning were treated. Ingestion of internal medications or drugs accounted for 59% of these, more than all other substances combined. Household preparations were responsible for 13% of the total. The one death during the 18 months followed ingestion by a two-year-old of three-quarters of a bottle of headache tablets.

Physicians and pharmacists have a major responsibility in this problem of accidental poisoning. Parents must be warned of the potential toxicity of every drug and instructed to keep them in a locked cupboard out of the child's reach.

RECENT ADVANCES IN THE UNDERSTANDING AND TREATMENT OF PANCREATITIS

Experimental evidence and clinical experience of the past decade lend support to the older concepts of the pathogenesis of pancreatitis, particularly the role of a common channel in relation to biliary reflux, the role of bile in the activation of trypsinogen, and the action of trypsin on the pancreas and its vascular supply. Other studies have emphasized the importance of pancreatic stasis secondary to pancreatic duct obstruction and superimposed ischæmia independent of the bile factor in the genesis of severe pancreatitis. A number of factors occurring in sequence appear to be involved in the development of pancreatic necrosis: obstruction to the outflow tract of the pancreas, stimulation of pancreatic secretion, activation of trypsinogen to trypsin within the pancreas, general severe ischæmia due to the action of trypsin on the vasculature of the pancreas, and widespread pancreatic necrosis due

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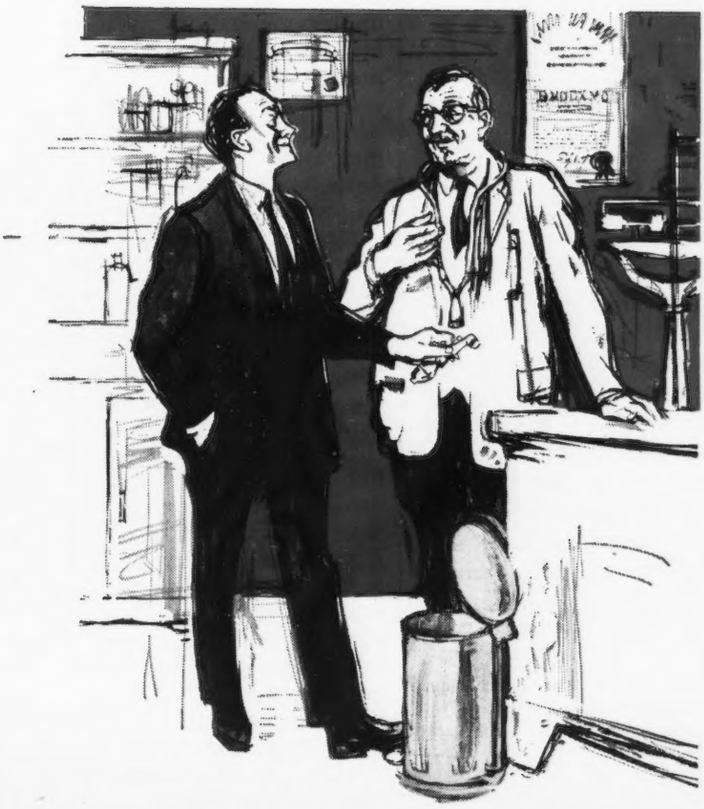

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Canad. M. A. J.
April 2, 1960, vol. 82

BOC

ANAESTHETIC NEWS

The history of anaesthesia

PART VI

Ethylene

By the middle of the 19th century, the field of anæsthesia was wide open. Scientists, doctors — even laymen — were experimenting in all facets of the science. New agents were being discovered — new equipment was being developed. Some were of little importance. Others went on to become vital to our methods today. One of these successful agents was ethylene or defiant gas. Although the date of the first use of ethylene by a man named Becker was not exactly known, Priestley, in his book (1779-86), accredits the discovery of the gas to a German investigator by name of Ingenhouss. The next mention of ethylene was after an examination in 1849 by Wunneley who reported it "not to be recommended as an anæsthetic agent." It was therefore ignored until 1864 when Ludimar Herman resumed investigation of the gas and noted its "mildly intoxicating action" and dropped his experiments.

Franz Lussem, in 1885, used ethylene to anæsthetize two dogs and a guinea pig and discovered that an 80% ethylene-oxygen mixture produced the best effect. He then inhaled the mixture himself and noted, after 18 minutes, "weakening of the arms and legs in addition to dizziness and uncertainty of gait." In 1918, Lussem's work was followed up by Arno Luckhardt and R. C. Thompson in experiments on animal protoplasm to establish the anæsthetic and analgesic qualities of the 80-20 mixture. From their experiments came the interesting side-light that the small amount of ethylene used in illuminating gas in greenhouses would put flowers "to sleep", that is, buds showing petals would fail to open farther.

Finally, after successful experimentation on Luckhardt and other volunteer workers, ethylene mixture was finally acknowledged as an anæsthetic agent for surgical practices . . . and in March 1923, Isabella Herb administered ethylene for surgeon Arthur Dean Bevan in the Presbyterian Hospital in Chicago. Within a month, Luckhardt was able to report on 106 surgical operations using ethylene as the general anæsthetic agent.

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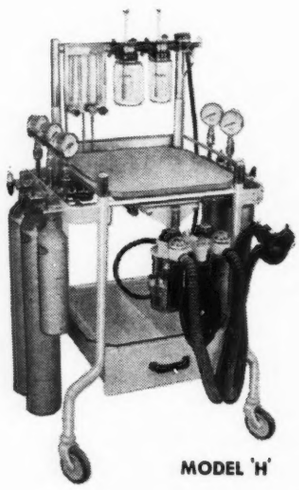

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MEDICAL NEWS *in brief*

(Continued from page 33)

to the final attack of trypsin on the ischæmic pancreatic parenchyma.

Recent contributions to the therapy of acute pancreatitis have emphasized the importance of vigorous replacement of the large deficits in blood plasma and red blood cells that occur in the initial phases, the value of antibiotic therapy in controlling secondary invasion by bacteria, and the possible value of the adrenal corticoids in the management of the disease.

A number of surgical procedures—each designed to correct a particular factor in the pathogenesis of the disease—are now available for the control of chronic pancreatitis. The selection of appropriate corrective measures will depend on a careful evaluation of the problem not only in relation to the pancreas but also to associated organ systems.— C. J. France, P. Perkins and D. Edwards, *Am. J. M. Sc.*, 238: 231, 1959.

—

$50,000,000 MARK NEARED IN RESEARCH SUPPORT BY AMERICAN HEART ASSOCIATION

Sums allotted to scientific research by the American Heart Association and its affiliates since its reorganization as a voluntary health agency in 1948 have approached the $50,000,000 mark, according to the Association's Annual Report. During the decade just ended, the report states, "The Association has emerged as the largest non-governmental source of support in the United States for scientific investigation in the broad areas of heart and circulatory disease."

The report notes that this status was the outgrowth of "the increasingly warm support given by the American people to the annual Heart Fund appeal" conducted each February. The 1959 Heart Fund drive, which raised the unprecedented sum of $24,004,865, "demonstrated more conclusively than ever before that the independent fund-raising campaign is the most effective means by far of obtaining maximum voluntary participation and support for the fight against heart disease." The 1959 total was more than nine times the sum contributed in the Association's first campaign in 1949.

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MEDICAL NEWS *in brief*

(Continued from page 34)

PARALYTIC RABIES IN TRINIDAD

The Caribbean Medical Journal devotes a whole issue of four numbers (Vol. 21, Nos. 1-4, 1959) to the history of an outbreak of paralytic rabies in Trinidad transmitted by vampire bats to human beings and lower animals in 1925 and onwards. It is an interesting account and must be read in its entirety to appreciate the efforts made to establish the cause and sources of the outbreak. It was first noted in July 1929, and 17 cases were recorded of the paralytic form of rabies. At the same time there was an occurrence of rabies in cattle. There was no proof of the source but the opinion was then held that the vampire bat was probably the vector. Later accounts, however, in 1934 established the fact that a paralytic rabies existed naturally in Trinidad amongst animals and human beings. There appeared to be a definite seasonal fluctuation in its incidence. Three species of bats were found infected and it was then definitely established that the rabies developed in human beings after the bat bites. Since these earlier studies, exhaustive studies of the bats in the country have been made and public health precautions have been put into effect, with the result of practically eliminating the occurrence of the disease in Trinidad.

—

POSTURE AND ANÆSTHESIA

In a paper on posture and anæsthesia (*Canad. Anæsth. Soc. J.*, 7: 12, 1960) D. N. Little points out that the effects of posture on respiration may include changes in pulmonary blood volume, changes in the compliance of the lungs, changes in the intrapulmonary distribution of the inspired air and limitations in the expansion of the lungs from simple mechanical interference with the normal diaphragmatic movement, the lateral expansion of the chest, and the anteroposterior expansion of the chest. These effects are reflected by the decreased vital capacity and decreased tidal volume seen in the various surgical postures and in time lead to fatigue of the respiratory muscles and hypoventilation.

The danger of cardiovascular collapse when the patient is moved during anæsthesia can be largely avoided by moving the patient slowly, gently and smoothly. The possibility of muscle aches or pains and nerve injuries following the use of the various surgical postures can be lessened by proper use of the position demanded by the specific operative procedure.

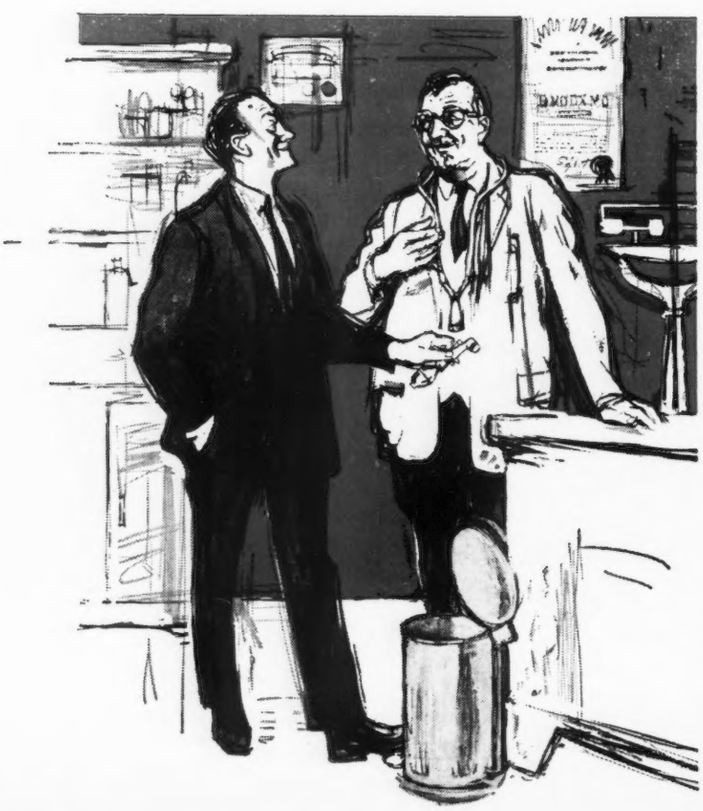
—

POSTGRADUATE COURSE IN INTERNAL MEDICINE

The American College of Physicians announces a postgraduate course in internal medicine to be held June 20-24, 1960, at the Indiana University School of Medicine, Indianapolis, Indiana.

The course will deal with selected subjects in the field of internal medicine and will emphasize pathological physiology and mechanisms of disease.

Registration should be made through the Executive Offices, The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.



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